IEI Technology Corp.

MODEL:

PM-US15W

PCI-104 SBC with Intel® Atom™ Z510/Z530 1.1/1.6 GHz CPU, Ethernet, USB 2.0, Audio, CF Card Type 2, RS-232, RS-422/485, IDE, RoHS Compliant

User Manual

Rev. 1.11 – 4 August, 2010

RoHS Lead Free

Revision

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Chapter

1

Introduction

1.1 PM-US15W Introduction

Figure 1–1: PM-US15W

The PCI-104 form factor PM-US15W is a highly integrated embedded computer specifically optimized for multi-media applications requiring minimum installation space. The PM-US15W is particularly suitable for low power and fan-less applications. The PM-US15W supports a full range of functions for an AT compatible industrial computer in a space-saving 90mm x 96mm profile. The PM-US15W is equipped with an on-board low-power consumption and high performance Intel® Atom™ Z510 1.1 GHz or Z530 1.6 GHz processor. It also contains a DDR2 SO-DIMM socket that supports up to 2 GB memory in size.

1.1.1 PM-US15W Motherboard Applications

The PM-US15W motherboard has been designed for use in industrial applications where board expansion is critical and operational reliability is essential.

1.1.2 PM-US15W Motherboard Benefits

Some of the PM-US15W motherboard benefits include,

- Operating reliably in harsh industrial environments with ambient temperatures ranging from 0°C to 60°C
- Rebooting automatically if the BIOS watchdog timer detects that the system is

no longer operating

1.1.3 PM-US15W Motherboard Features

Some of the PM-US15W motherboard features are listed below:

- Complies with RoHS
- Supports Intel® Atom™ Z510/Z530 CPU
- Supports a maximum front side bus (FSB) speed up to 533MHz
- DDR 533 SO-DIMM SDRAM up to 2 GB
- Complete I/O support with IDE, CF Type II, PCI-104, LAN, and 4 x USB2.0 and 4 x RS-232
- Supports 18/24-bit LVDS LCD

1.2 PM-US15W Motherboard Overview

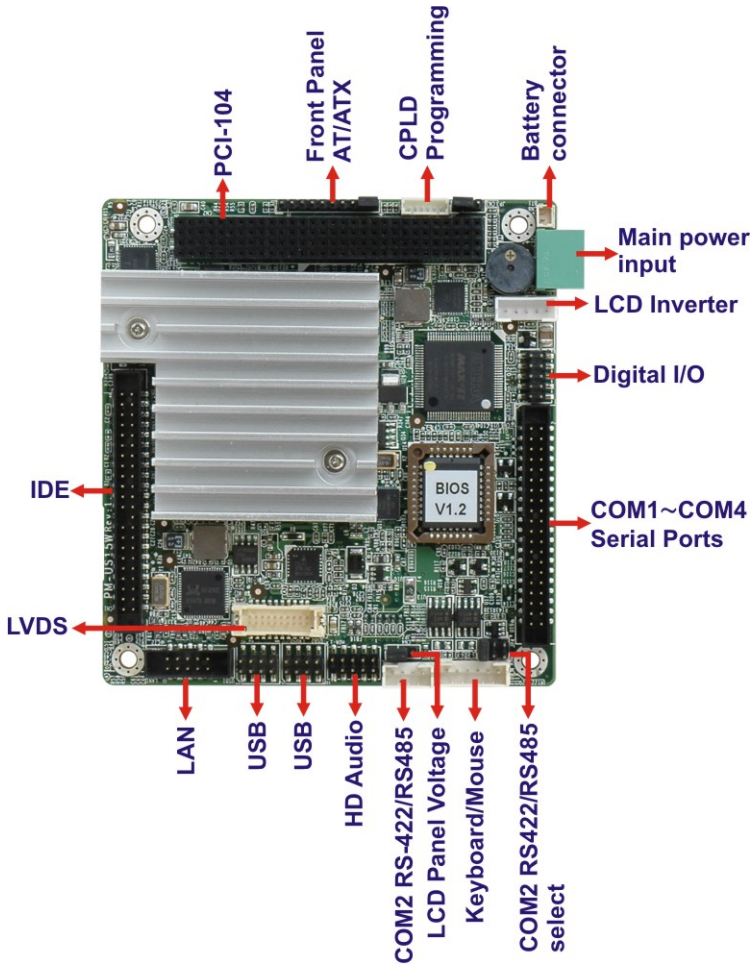


Figure 1-2: PM-US15W Motherboard Overview

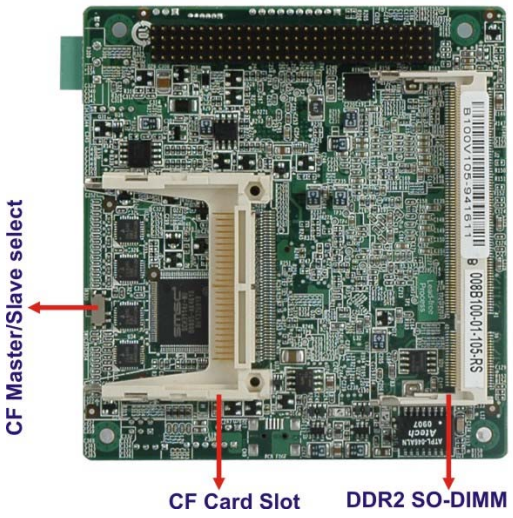


Figure 1-3: PM-US15W Motherboard Solder Side Overview

1.2.1 PM-US15W Motherboard Connectors

The PM-US15W motherboard has the following connectors on-board:

- 1 x AT/ATX 12V/5V connector
- 1 x CompactFlash® connector (solder side)
- 1 x DDR2 SO-DIMM connector (solder side)
- 1 x Digital I/O connector
- 1 x HD audio connector (supported via optional 7.1 channel HD audio kit with Realtek ALC883 codec)
- 1 x IDE device connector
- 1 x Keyboard/mouse connector
- 1 x LAN connector
- 1 x LCD Inverter connector
- 1 x LED connector
- 1 x LVDS LCD connector
- 1 x PCI-104 connector
- 4 x RS-232 connectors
- 1 x RS-422/485 connector (shared with COM2)
- 4 x USB connectors

These connectors are fully described in **Chapter 3**.

1.3 Dimensions

The dimensions of the board are listed below:

- **Length**: 96mm
- **Width**: 90mm

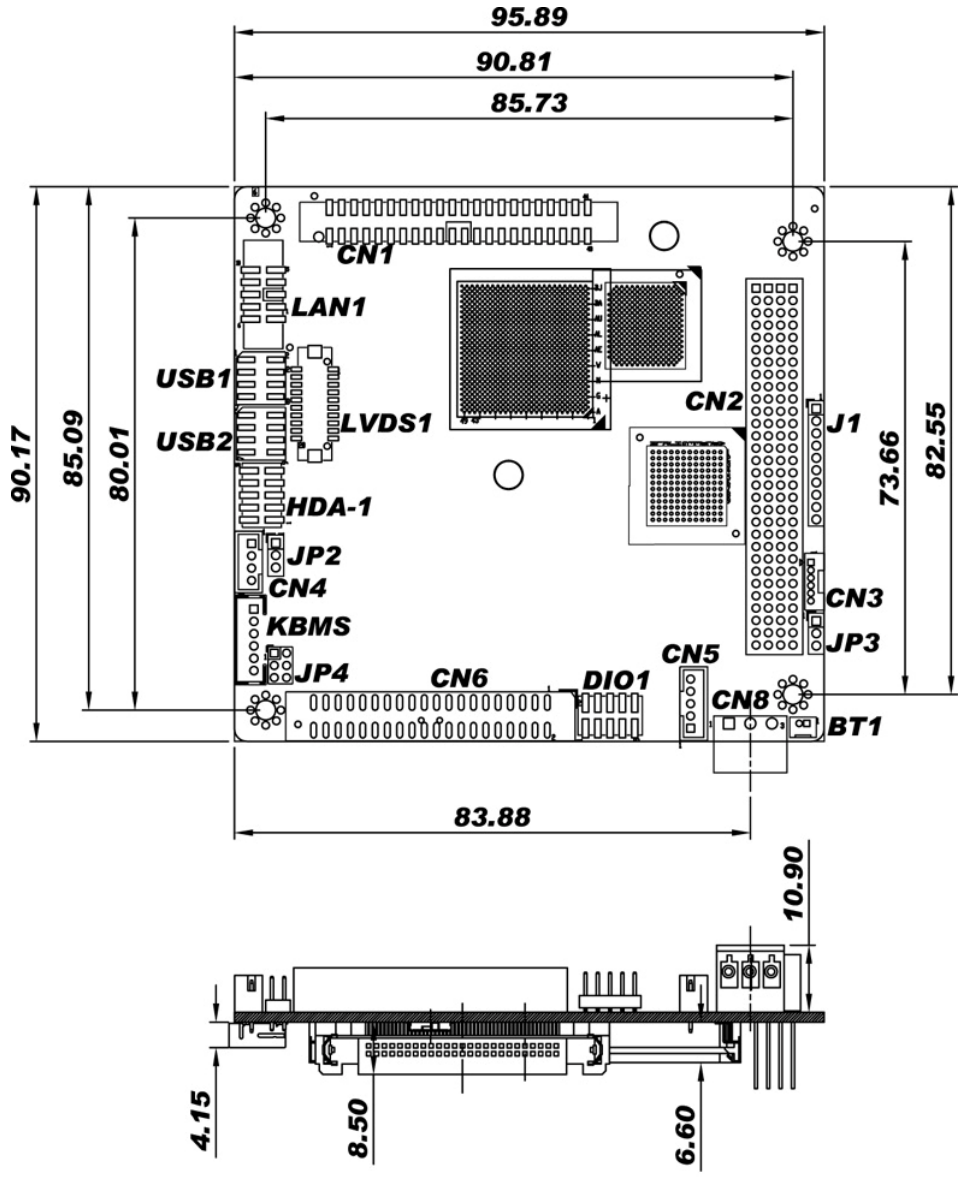


Figure 1-4: PM-US15W Dimensions (mm)

1.4 Data Flow

The PM-US15W motherboard comes with an Intel® Atom™ Z510/Z530 500MHz processor and an Intel® US15W Northbridge. **Figure 1-5** shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

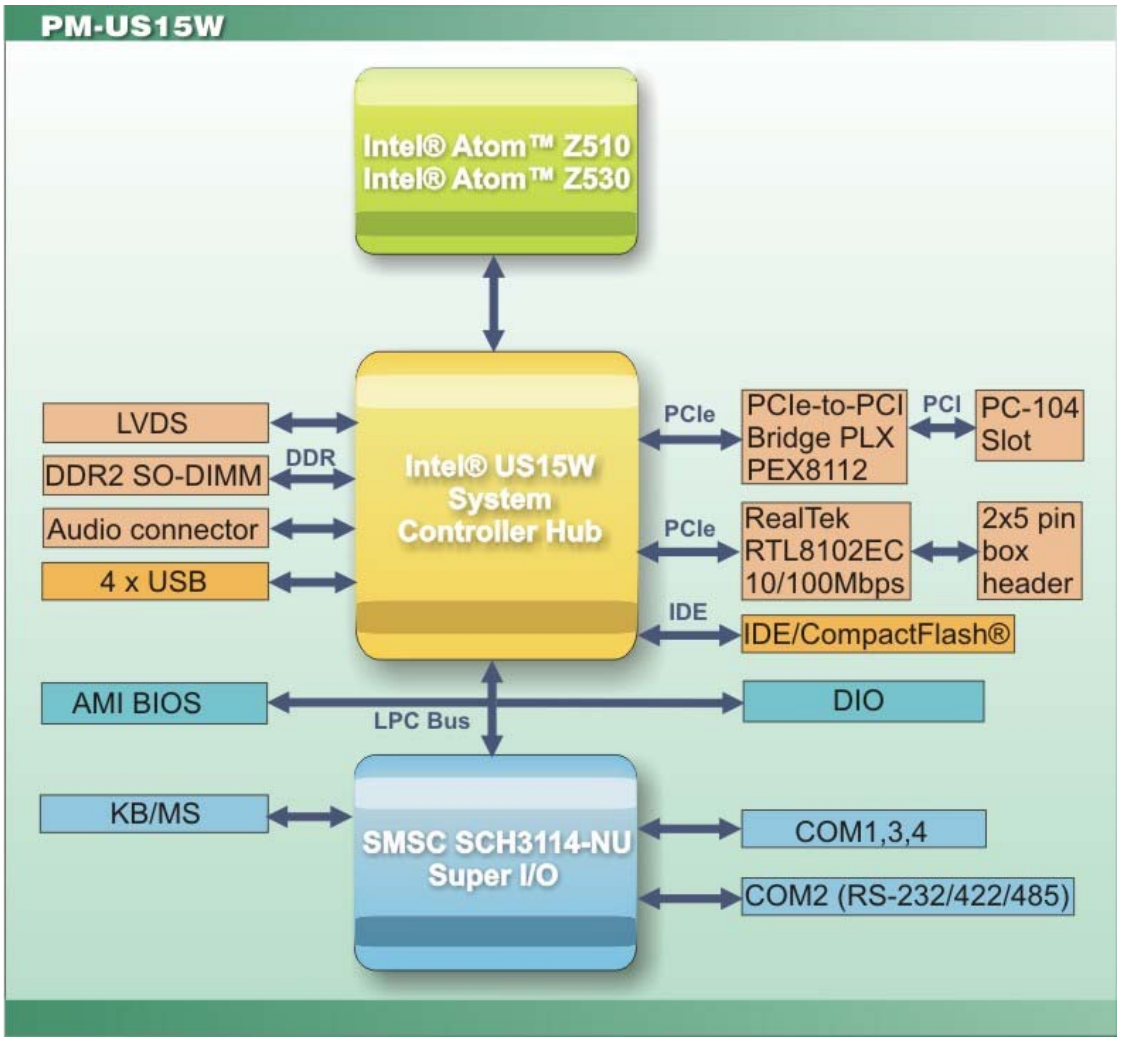


Figure 1-5: Data Flow Block Diagram

1.5 Technical Specifications:

PM-US15W motherboard technical specifications are listed in the table below.

Specification/Model	PM-US15W
Form Factor	PCI-104 Module
CPU	Intel® Atom™ Z510 1.1 GHz with 400 MHz FSB without Hyper-threading support Intel® Atom™ Z530 1.6 GHz with 533 MHz FSB with Hyper-threading support
Integrated Graphics	Intel® US15W
Memory	One 200-pin 400/533 MHz SO-DIMM DDR2 slot (up to 2 GB)
System Controller Hub Chipset	Intel® US15W
BIOS	AMI BIOS
Compatible OS	Microsoft Windows XP SP2 Microsoft Windows Vista Business (32bit) Linux Ubuntu 8.10 Linux Fedora Core 6
Digital I/O	8-bit digital I/O, 4-bit input/ 4-bit output
Ethernet Controller	Realtek RTL8102EC
Super I/O Controller	SMSC SCH3114-NU
Real Time Clock	256 bytes of battery-backed RAM, 32.768 KHz crystal, 3 V battery
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Expansion	
PCI	One PCI-104 via PLX PEX8112 PCIe-to-PCI bridge
I/O Interface Connectors	
Audio	One HD audio connector (supported via optional 7.1 channel HD audio kit with Realtek ALC883 codec)

Specification/Model	PM-US15W
Display	18/24-bit single channel LVDS (VGA supported by optional LVDS-to-VGA module)
Ethernet	One LAN connector
Keyboard/Mouse	One KB/MS connector
Serial	Four RS-232 One RS-422/485 (shared with COM2)
USB 2.0/1.1	Four USB 2.0
Storage	
IDE	One IDE connector
CF	One CF card slot
Environmental and Power Specifications	
Power Supply	5V only, AT/ATX support
Power Consumption	5 V @ 1.84A (Intel® Atom™ Z510 1.1 GHz with 1 GB DDR2)
Operating temperature	0ºC ~ 60ºC
Humidity	5% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	90mm x 96mm
Weight GW/NW	650g/250g

Table 1-1: PM-US15W Specifications

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the PM-US15W may result in permanent damage to the PM-US15W and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PM-US15W. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PM-US15W or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the PM-US15W, place it on an antic-static pad. This reduces the possibility of ESD damaging the PM-US15W.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

2.2 Unpacking Precautions

When the PM-US15W is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the PM-US15W does not fall out of the box.
- Make sure all the components shown in **Section 2.3** are present.

2.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the PM-US15W from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

2.3.1 Package Contents

The PM-US15W is shipped with the following components:

Quantity	Item and Part Number	Image
1	PM-US15W-Z530-R11 (or) PM-US15W-Z510-R11	
1	ATA/33 flat cable (**P/N**: 32200-000009-RS)	
1	LAN cable (**P/N**: 32000-055702-RS)	
1	Power cable (**P/N**: 32000-130200-RS)	
1	Quad port RS-232 cable (**P/N**: 32200-025401-RS)	

2	Dual USB cable (without bracket) (**P/N**: 32000-070301-RS)	
1	Mini jumper Pack	
1	Quick Installation Guide	
1	Utility CD	

Table 2-1: Package List Contents

2.4 Optional Items

RS-422/485 cable (**P/N**: 32000-074800-RS)	
Audio Kit, 7.1 channel HD audio Realtek ALC883 codec (**P/N**: AC-KIT883HD-R10)	
IDE to 2.5” SATA module (**P/N**: ITS-44-R10)	
LVDS to VGA converter board (**P/N**: LVDS-VGA-R10)	
Cable for LVDS-VGA-R10 Module (**P/N**: 32600-114400-RS)	

Table 2-2: Package List Contents (Optional Items)

Chapter

3

Connectors

3.1 Peripheral Interface Connectors

The locations of the peripheral interface connectors are shown in **Section 3.1.1**. A complete list of all the peripheral interface connectors can be seen in **Section 3.1.2**.

3.1.1 PM-US15W Motherboard Layout

Figure 3-1 shows the on-board peripheral connectors and jumpers on the front side of the board.

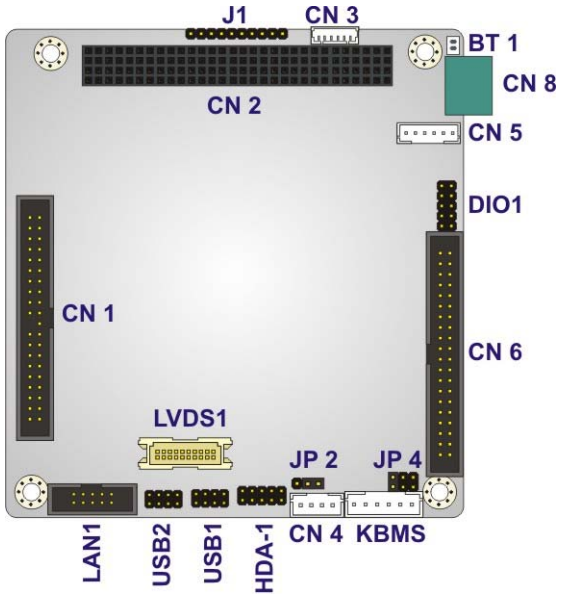


Figure 3-1: Connector and Jumper Locations (Front Side)

Figure 3-2 shows the onboard peripheral connectors on the solder side of the board.

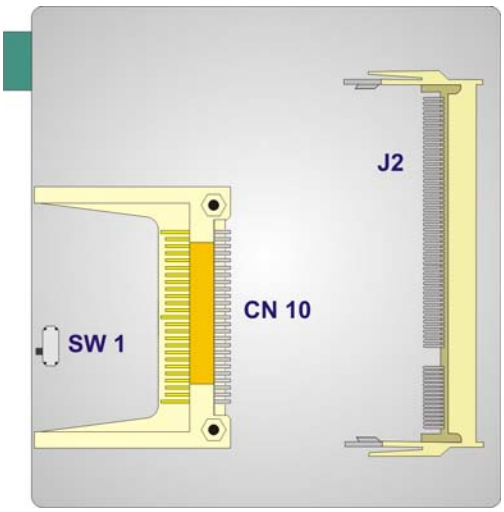


Figure 3-2: Connector and Jumper Locations (Solder Side)

3.1.2 Peripheral Interface Connectors

The table below shows a list of the peripheral interface connectors on the PM-US15W motherboard. Detailed descriptions of these connectors can be found in the following section.

Connector	Type	Label
12V / 5V Power connector	3-pin terminal block	CN8
Battery connector	2-pin wafer connector	BT1
CompactFlash® Type II connector	50-pin header	CN10
CPLD Programming connector	6-pin wafer	CN3
DDR2 SO-DIMM socket	200-pin socket	J2
Digital I/O connector	10-pin header	DIO1
Front panel connector	10-pin header	J1
HD Audio connector	10-pin header	HAD-1
IDE interface connector	44-pin box header	CN1
Keyboard/Mouse connector	6-pin wafer connector	KBMS
LAN connector	10-pin box header	LAN1
LCD inverter connector	5-pin wafer connector	CN5

Connector	Type	Label
LVDS LCD connector	20-pin crimp connector	LVDS1
PCI-104 connector	120-pin socket	CN2
RS-232 Serial ports 1-4 connector	40-pin box header	CN6
RS-422/85 Serial port connector	4-pin box header	CN4
USB connectors	8-pin header	USB1, USB2

Table 3-1: Peripheral Interface Connectors

3.2 Internal Peripheral Connectors

Internal peripheral connectors on the motherboard are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the PM-US15W motherboard.

3.2.1 12V / 5V Power Connector

CN Label: CN8

CN Type: 3-pin terminal block

CN Location: See **Figure 3-3**

CN Pinouts: See **Table 3-2**

The **12V / 5V Power Connector** supplies power to the motherboard.

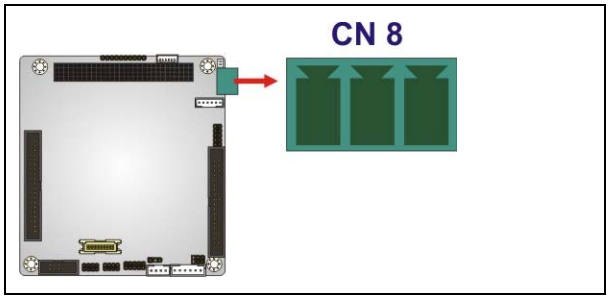


Figure 3-3: 12V / 5V Power Connector Location

PIN NO.	DESCRIPTION
1	VCC12
2	GND
3	VCC5

Table 3-2: 12V / 5V Power Connector Pinouts

3.2.2 DDR2 SO-DIMM Socket

CN Label: **J2** (solder side)

CN Type: 200-pin socket

CN Location: See **Figure 3-4**

CN Pinouts: See **Table 3-3**

The 200-pin DDR2 SO-DIMM socket receives a DDR2 533/400 MHz SO-DIMM module.

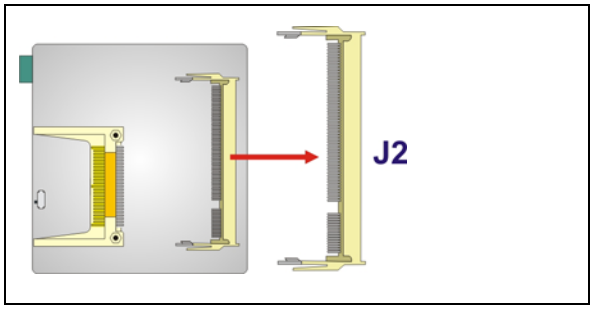


Figure 3-4: DDR2 SO-DIMM Socket Location

PIN	FRONT	PIN	BACK	PIN	FRONT	PIN	BACK
1	VREF	2	VREF	101	A9	102	A8
3	VSS	4	VSS	103	VSS	104	VSS
5	DQ0	6	DQ4	105	A7	106	A6
7	DQ1	8	DQ5	107	A5	108	A4
9	VDD	10	VDD	109	A3	110	A2
11	DQS0	12	DM0\DQS9	111	A1	112	A0
13	DQ2	14	DQ6	113	VDD	114	VDD
15	VSS	16	VSS	115	A10\AP	116	BA1
17	DQ3	18	DQ7	117	BA0	118	/RAS

PIN	FRONT	PIN	BACK	PIN	FRONT	PIN	BACK
19	DQ8	20	DQ12	119	/WE	120	/CAS
21	VDD	22	VDD	121	/S0	122	/S1
23	DQ9	24	DQ13	123	DU(A13)	124	DU(BA2)
25	DQS1	26	DM1\DQS10	125	VSS	126	VSS
27	VSS	28	VSS	127	DQ32	128	DQ36
29	DQ10	30	DQ14	129	DQ33	130	DQ37
31	DQ11	32	DQ15	131	VDD	132	VDD
33	VDD	34	VDD	133	DQS4	134	DM4\DQS13
35	CK0	36	VDD	135	DQ34	136	DQ38
37	/CK0	38	VSS	137	VSS	138	VSS
39	VSS	40	VSS	139	DQ35	140	DQ39
41	DQ16	42	DQ20	141	DQ40	142	DQ44
43	DQ17	44	DQ21	143	VDD	144	VDD
45	VDD	46	VDD	145	DQ41	146	DQ45
47	DQS2	48	DM2\DQS11	147	DQS5	148	DM5\DQS14
49	DQ18	50	DQ22	149	VSS	150	VSS
51	VSS	52	VSS	151	DQ42	152	DQ46
53	DQ19	54	DQ23	153	DQ43	154	DQ47
55	DQ24	56	DQ28	155	VDD	156	VDD
57	VDD	58	VDD	157	VDD	158	/CK1
59	DQ25	60	DQ29	159	VSS	160	CK1
61	DQS3	62	DM3\DQS12	161	VSS	162	VSS
63	VSS	64	VSS	163	DQ48	164	DQ52
65	DQ26	66	DQ30	165	DQ49	166	DQ53
67	DQ27	68	DQ31	167	VDD	168	VDD
69	VDD	70	VDD	169	DQS6	170	DM6\DQS15
71	CB0*	72	CB4*	171	DQ50	172	DQ54
73	CB1*	74	CB5*	173	VSS	174	VSS
75	VSS	76	VSS	175	DQ51	176	DQ55
77	DQS8*	78	DM8\DQS17*	177	DQ56	178	DQ60
79	CB2*	80	CB6*	179	VDD	180	VDD
81	VDD	82	VDD	181	DQ57	182	DQ61

PIN	FRONT	PIN	BACK	PIN	FRONT	PIN	BACK
83	CB3*	84	CB7*	183	DQS7	184	DM7\DQS16
85	DU	86	DU(/RESET)	185	VSS	186	VSS
87	VSS	88	VSS	187	DQ58	188	DQ62
89	CK2*	90	VSS	189	DQ59	190	DQ63
91	/CK2*	92	VDD	191	VDD	192	VDD
93	VDD	94	VDD	193	SDA	194	SA0
95	CKE1	96	CKE0	195	SCL	196	SA1
97	DU	98	DU	197	VDDSPD	198	SA2
99	A12	100	A11	199	VDDID*	200	DU

Table 3-3: DDR2 SO-DIMM Socket Pinouts

3.2.3 Battery Connector

CN Label: BT1

CN Type: 2-pin wafer connector

CN Location: See **Figure 3-5**

CN Pinouts: See **Table 3-4**

This battery connector connects to an externally mounted 3V, Lithium, cell coin battery (VARTA CR2032). The life expectancy of the battery is approximately seven years. Depending on the working condition, the life expectancy may be shorter.

Replacing the battery is not a user operation.

If the battery starts to weaken and lose voltage, contact a vendor or IEI for a replacement module. Dispose of the used battery properly. Contact the local waste disposal agency for disposal instructions. Do not dispose of a used battery with normal household waste.

WARNING!

1. Keep batteries away from children.
2. There is a danger of explosion if the battery is incorrectly replaced.
3. Only a certified module from IEI can be used as a replacement.
4. Do not expose the battery to excessive heat or fire.
5. If the battery shows signs of leakage, contact a local vendor or IEI immediately.

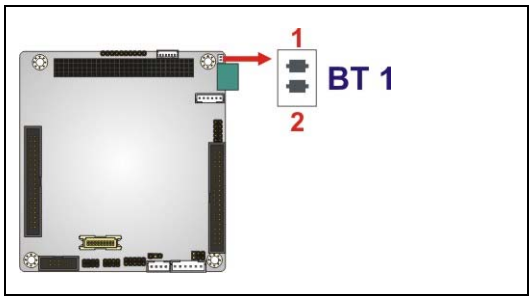


Figure 3-5: Battery Connector Location

PIN NO.	DESCRIPTION
1	BAT+
2	GND

Table 3-4: Battery Connector Pinouts

3.2.4 CompactFlash® Connector

CN Label: **CN10** (solder side)

CN Type: 50-pin header (2x25)

CN Location: See **Figure 3-6**

CN Pinouts: See **Table 3-5**

A CompactFlash® memory module is inserted to the CompactFlash® connector.

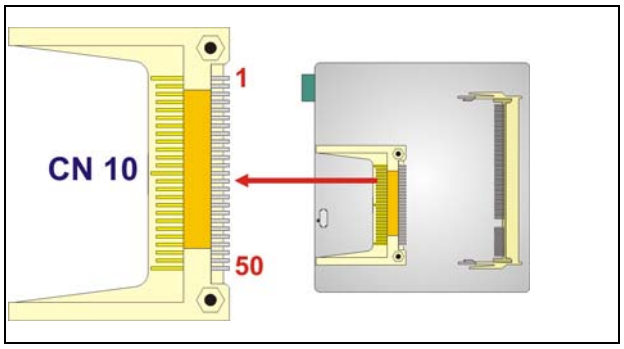


Figure 3-6: CompactFlash® Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	D3
3	D4	4	D5
5	D6	6	D7
7	CE#	8	GND
9	GND	10	GND
11	GND	12	GND
13	VCC (+5V)	14	GND
15	GND	16	GND
17	GND	18	A2
19	A1	20	A0
21	D0	22	D1
23	D2	24	NC
25	CD2#	26	CD1#
27	D11	28	D12
29	D13	30	D14
31	D15	32	CE2#
33	NC	34	IOR#
35	IOW#	36	WE#
37	IRQ	38	VCC(+5V)
39	CSEL#	40	NC
41	RESET#	42	WAIT#
43	INPACK#	44	REG#
45	BVD2	46	BVD1

47	D8	48	D9
49	D10	50	GND

Table 3-5: CompactFlash® Connector Pinouts

3.2.5 CPLD Programming Connector

CN Label: CN3

CN Type: 6-pin wafer connector

CN Pinouts: See **Figure 3-7**

CN Location: See **Table 3-6**

The CPLD programming connector can be connected to a device to program or debug the CPLD (Complex Programming Logic Device).

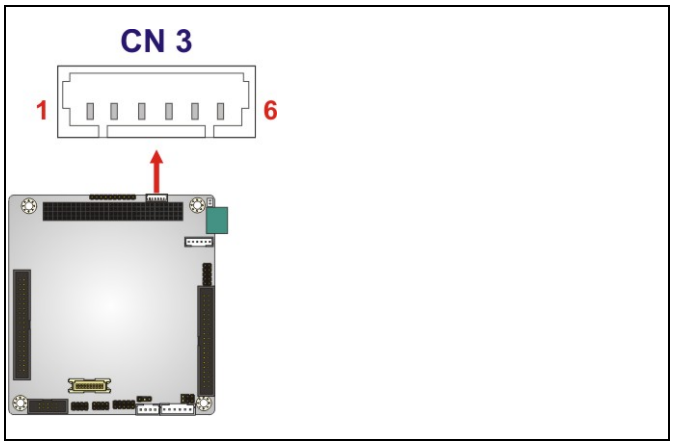


Figure 3-7: CPLD Programming Connector Location

PIN NO.	DESCRIPTION
1	VCC (+3.3V)
2	EPM_TMS
3	EPM_TDO
4	EPM_TCK
5	EPM_TDI
6	GND

Table 3-6: CPLD Programming Connector Pinouts

3.2.6 Digital I/O Connector

CN Label: **DIO1**

CN Type: 10-pin header

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-7**

The digital I/O connector provides programmable input and output for external devices. The digital I/O provides 4-bit output and 4-bit input.

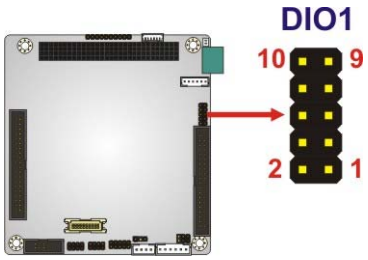


Figure 3-8: Digital I/O Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 3-7: Digital I/O Connector Pinouts

3.2.7 HD Audio Kit Connector

CN Label: **HDA-1**

CN Type: 10-pin header

CN Location: See **Figure 3-9**

CN Pinouts: See **Table 3-8**

This connector connects to an external audio kit.

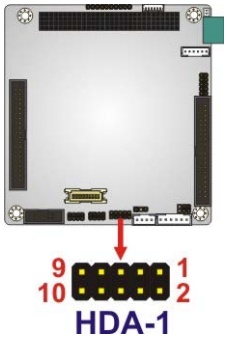


Figure 3-9: Audio Kit Connector Location

Pin	Description	Pin	Description
1	HAD_SYNC	2	HAD_CLK
3	HAD_SDO	4	SCH_SPKR
5	HAD_SDI0	6	HAD_RST#
7	+5V	8	GND
9	+12V	10	GND

Table 3-8: Audio Kit Connector Pinouts

3.2.8 IDE Connector (Primary, 44-pin)

CN Label: CN1

CN Type: 44-pin box header

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-9**

One primary 44-pin IDE device connector on the PM-US15W CPU board supports connectivity to Ultra ATA/33/66/100/133 IDE devices with data transfer rates up to 133MB/s.

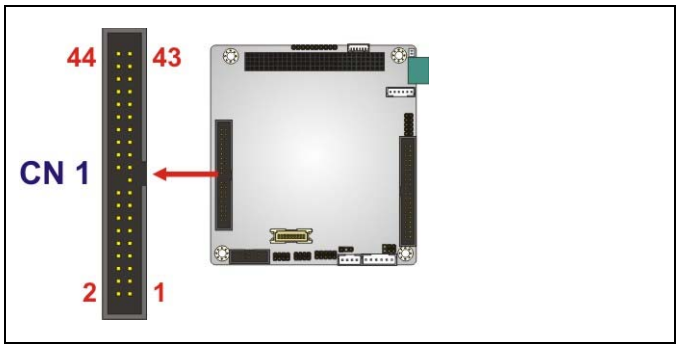


Figure 3-10: Primary IDE Device Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND–DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND
41	VCC	42	VCC
43	GROUND	44	N/C

Table 3-9: Primary IDE Connector Pinouts

3.2.9 Keyboard/Mouse Connector

CN Label:	KBMS
CN Type:	6-pin wafer connector
CN Pinouts:	See **Figure 3-11**
CN Location:	See **Table 3-10**

The keyboard and mouse connector can be connected to a standard PS/2 cable or PS/2 Y-cable to add keyboard and mouse functionality to the system.

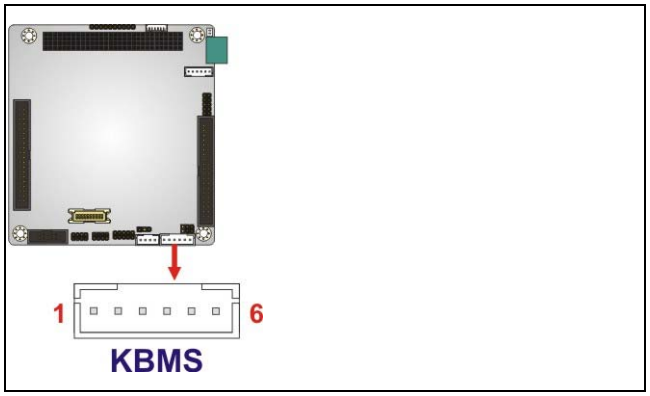


Figure 3-11: Keyboard/Mouse Connector Location

PIN NO.	DESCRIPTION
1	VCC5
2	MOUSE DATA
3	MOUSE CLOCK
4	KEYBOARD DATA
5	KEYBOARD CLOCK
6	GND

Table 3-10: Keyboard/Mouse Connector Pinouts

3.2.10 LAN Connector

CN Label: LAN1

CN Type: 10-pin box header

CN Location: See **Figure 3-12**

CN Pinouts: See **Table 3-11**

The PM-US15W is equipped with an Ethernet controller. The Ethernet controller is interfaced to the external LAN by direct connection to the LAN connection or by connecting the LAN connector to an RJ-45 interface connector.

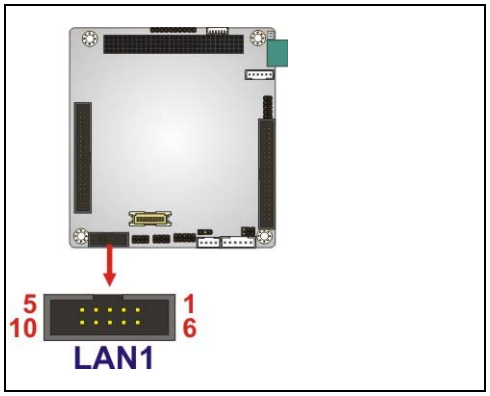


Figure 3-12: LAN Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC3.3	6	Active
2	RX+	7	RX-
3	Link	8	GND
4	N/C	9	GND
5	TX+	10	TX-

Table 3-11: LAN Connector Pinouts

3.2.11 LCD Inverter Connector

CN Label: CN5

CN Type: 5-pin wafer connector

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-12**

The Inverter connector connects to the LCD backlight.

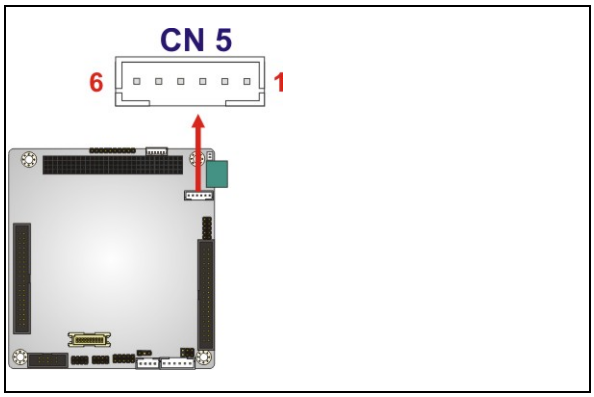


Figure 3-13: LCD Inverter Connector Location

PIN NO.	DESCRIPTION
1	LCD_BKLTCTL
2	GROUND
3	VCC12
4	GROUND
5	LCD_BKLEN

Table 3-12: LCD Inverter Connector Pinouts

3.2.12 Front Panel Connector

CN Label: J1

CN Type: 10-pin header

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-13**

The front panel connector provides the connectivity to the power and reset buttons, power and hard drive activity LEDs on the chassis front panel. An adapter cable is required. Pins 9-10 are the AT/ATX setting jumper.

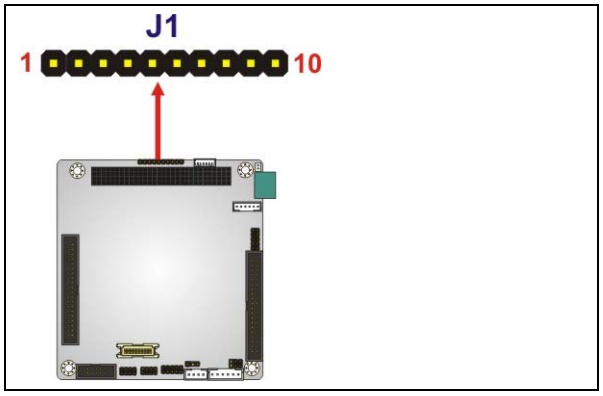


Figure 3-14: Front Panel Connector Location

PIN NO.	DESCRIPTION
1	VCC (+5V) LED+
2	GND
3	VCC (+5V) LED+
4	HDD LED-
5	PWR BTN1
6	GND
7	RESET1
8	GND
9	ATX_SEL#
10	GND

Table 3-13: LED Connector Pinouts

3.2.13 PCI-104 Connector

CN Label: **CN2**

CN Type: 120-pin socket

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-14**

The PCI-104 connector is for installing a PCI-104 expansion card.

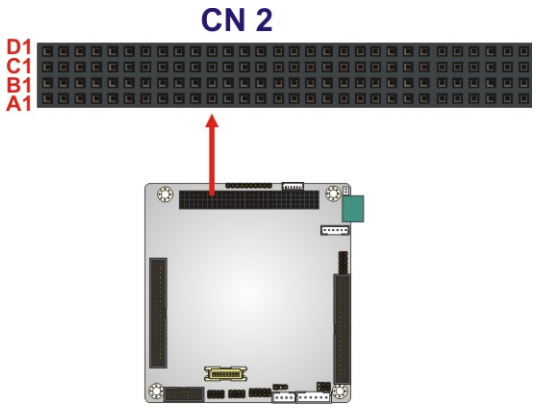


Figure 3-15: PCI-104 Connector Location

Pin No.	Column A	Column B	Column C	Column D
1	GND/5 V	TBD1	5 V	AD00
2	VI/O1	AD02	AD01	+5 V
3	AD05	GND	AD04	AD03
4	C/BE0#	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O2	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3 V	C/BE1#	AD15	+3.3 V
9	SERR#	GND	SB0#	PAR
10	GND	PERR#	+3.3 V	SDONE
11	STOP#	+3.3 V	LOCK#	GND
12	+3.3 V	TRDY#	GND	DEVSEL#
13	FRAME#	GND	IRDY#	+3.3 V
14	GND	AD16	+3.3 V	C/BE2#
15	AD18	+3.3 V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3 V	AD23	AD22	+3.3 V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3#	VI/O1	IDSEL3

Pin No.	Column A	Column B	Column C	Column D
20	GND	AD26	AD25	GND
21	AD29	+5 V	AD28	AD27
22	+5 V	AD30	GND	AD31
23	REQ0#	GND	REQ1#	VI/O2
24	GND	REQ2#	+5 V	GNT0#
25	GNT1#	VI/O3	GNT2#	GND
26	+5 V	CLK0	GND	CLK1
27	CLK2	+5 V	CLK3	GND
28	GND	INTD#	+5 V	RST#
29	+12 V	INTA#	INTB#	INTC#
30	-12 V	TBD2	TBD	GND/3.3 V

Table 3-14: PCI-104 Connector Pinouts

3.2.14 RS-232 Serial Port Connectors

CN Label: CN6

CN Type: 40-pin box header

CN Location: See **Figure 3-16**

CN Pinouts: See **Table 3-15**

The serial ports connector connects to RS-232 serial port devices.

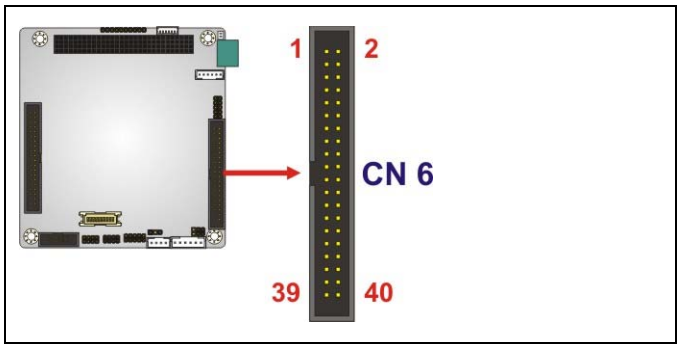


Figure 3-16: RS-232 Serial Port Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD1#	2	DSR1#
3	RX1	4	RTS1#
5	TX1	6	CTS1#
7	DTR1#	8	RI1#
9	GND	10	GND
11	DCD2#	12	DSR2#
13	RX2	14	RTS2#
15	TX2	16	CTS2#
17	DTR2#	18	RI2#
19	GND	20	GND
21	DCD3#	22	DSR3#
23	RX3	24	RTS3#
25	TX3	26	CTS3#
27	DTR3#	28	RI3#
29	GND	30	GND
31	DCD4#	32	DSR4#
33	RX4	34	RTS4#
35	TX4	36	CTS4#
37	DTR4#	38	RI4#
39	GND	40	GND

Table 3-15: RS-232 Serial Port Connector Pinouts

3.2.15 RS-422/485 Serial Port Connector

CN Label: CN4

CN Type: 4-pin wafer connector

CN Location: See **Figure 3-17**

CN Pinouts: See **Table 3-16**

The serial port connector connects to an RS-422 or RS-485 serial port device.

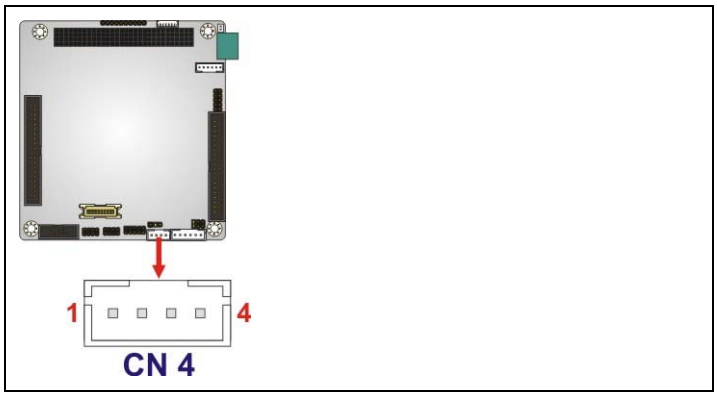


Figure 3-17: RS-422/485 Serial Port Connector Location

PIN NO.	DESCRIPTION
1	RXD485#
2	RXD485+
3	TXD485+
4	TXD485#

Table 3-16: RS-422/RS-485 Serial Port Connector Pinouts

3.2.16 LVDS LCD Connector

CN Label: LVDS1

CN Type: 20-pin crimp connector

CN Location: See **Figure 3-18**

CN Pinouts: See **Table 3-17**

The LVDS connector is connected to a LVDS LCD display device.

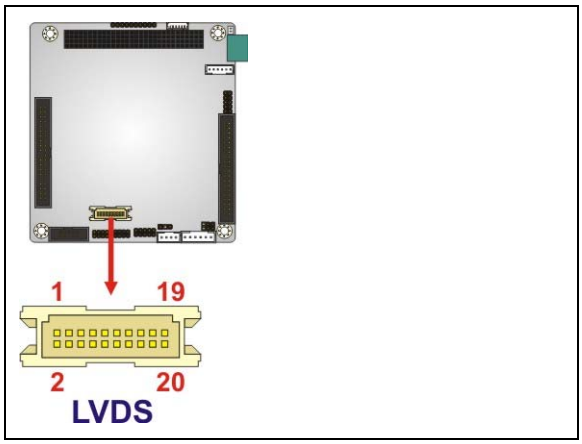


Figure 3-18: LVDS LCD Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
2	GND	1	GND
4	AY0-	3	AY0+
6	AY1-	5	AY1+
8	AY2-	7	AY2+
10	AYCLK-	9	AYCLK+
12	AY3-	11	AY3+
14	GND	13	GND
16	NC	15	NC
18	LCDVCC	17	LCDVCC
20	LCDVCC	19	LCDVCC

Table 3-17: LVDS Connector Pinouts

3.2.17 USB Connector

CN Label: USB1 and USB2

CN Type: 8-pin header (2x4)

CN Location: See **Figure 3-19**

CN Pinouts: See **Table 3-18**

The 2x4 USB pin connectors provide connectivity to USB 2.0 ports. Each USB connector can support two USB devices. The USB port is used for I/O bus expansion.

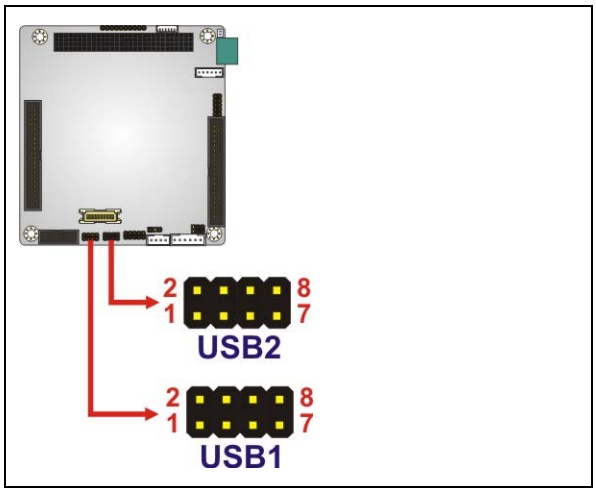


Figure 3-19: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBVCC1	2	GND
3	D1F-	4	D2F+
5	D1F+	6	D2F-
7	GND	8	USBVCC1

Table 3-18: USB Port Connector Pinouts

Chapter

4

Installation

4.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the PM-US15W may result in permanent damage to the PM-US15W and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the PM-US15W. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the PM-US15W or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the PM-US15W, place it on an antic-static pad. This reduces the possibility of ESD damaging the PM-US15W.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the PM-US15W is installed. All installation notices should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the PM-US15W and injury to the person installing the motherboard.

4.2.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the PM-US15W, PM-US15W components and injury to the user.

Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the PM-US15W installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD):
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the PM-US15W on an antistatic pad:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the PM-US15W off:
  - When working with the PM-US15W, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the PM-US15W **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.2.2 Installation Checklist

The following checklist is provided to ensure the PM-US15W is properly installed.

- All the items in the packing list are present
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The PM-US15W is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - IDE drives
  - RS-232 devices
  - RS-422/485 devices
  - Keyboard and mouse
  - LAN
  - LCD backlight
  - Power
  - LVDS LCD screen
  - USB port

WARNING:

A CPU should never be turned on without its heat sink being installed. If the heat sink is removed and the system turned on, permanent damage to the CPU, PM-US15W and other electronic components attached to the system may be incurred. Running a CPU without a heat sink may also result in injury to the user.

4.3 Unpacking

When the PM-US15W is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 4.1**.
- Make sure the packing box is facing upwards so the PM-US15W does not fall out of the box.
- Make sure all the components in the checklist shown in **Chapter 2.3.1** are present.

NOTE:

If some of the components listed in the checklist in **Chapter 2.3.1** are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the PM-US15W from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

4.4 SO-DIMM and CompactFlash® Installation

When purchasing SO-DIMM modules, the following considerations should be taken into account:

- The maximum SO-DIMM capacity supported is 2.0 GB
- The maximum SO-DIMM frequency supported is 533 MHz
- The SO-DIMM chip must be a 200-pin memory chip

4.4.1 SO-DIMM Module Installation

The PM-US15W motherboard has one 200-pin DDR2 SO-DIMM socket. To install the DDR2 SO-DIMM module, follow the instructions below.

Step 1: Turn the PM-US15W over so that the SO-DIMM socket is facing up.

Step 2: Push the SO-DIMM chip into the socket at an angle. (See **Figure 4-1**)

Step 3: Gently pull the arms of the SO-DIMM socket out and push the rear of the SO-DIMM module down. (See **Figure 4-1**)

Step 4: Release the arms of the SO-DIMM socket. They clip into place and secure the SO-DIMM module in the socket.

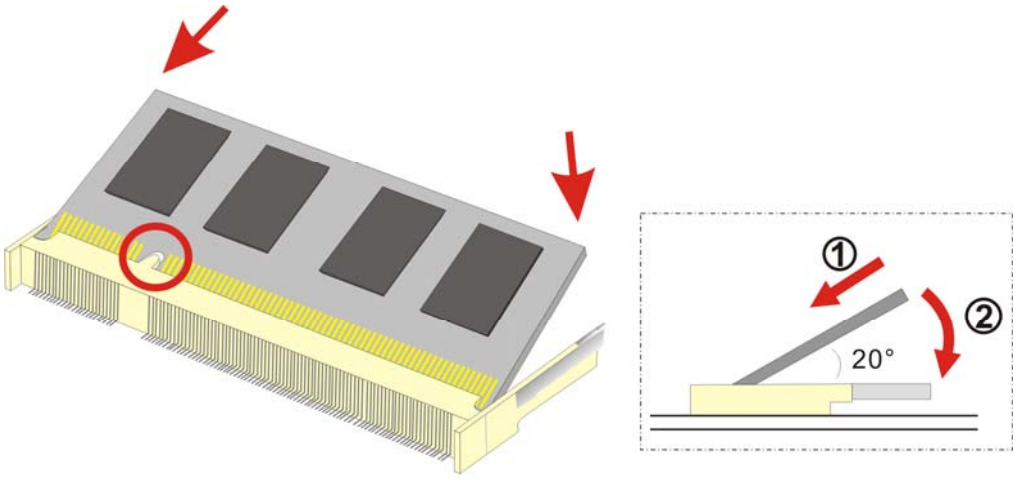


Figure 4-1: SO-DIMM Module Installation

The SO-DIMM is a critical component of the PM-US15W and cannot be run if it is not installed.

4.5 CompactFlash® Card Installation

A CompactFlash® Type II (CF Type II) card slot is located on the solder side of the CPU board. When appropriately formatted, a CF Type II card can serve as a bootable hard drive in applications where installation space is limited. The CF Type II card occupies a secondary IDE channel. Configuration options can be found through the BIOS configuration utility.

To install a CF Type II card, follow the instructions below.

Step 1: Turn the CPU board over so that the CF Type II card socket is facing up.

Step 2: Gently push the CF Type II card into the socket until it clicks into place. (See **Figure 4-2**)

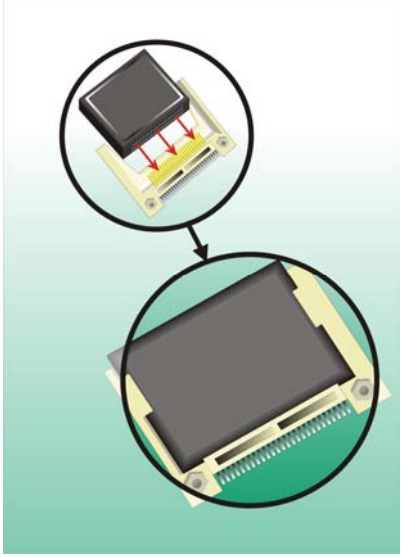
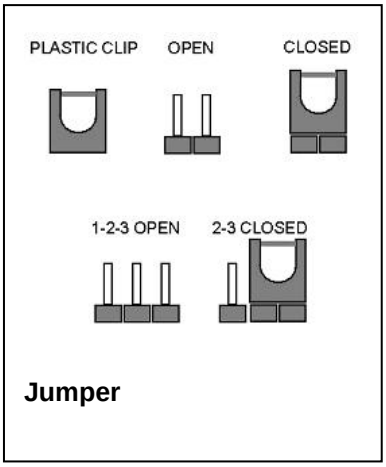


Figure 4-2: CompactFlash® Card Installation

4.6 Jumper Settings

NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



Jumper

Before the PM-US15W is installed in the system, the jumpers must be set in accordance with the desired configuration. There are three jumpers on the PM-US15W. These three jumpers are listed in the table below.

Description	Label	Type
AT/ATX	J1	10-pin header (pins 9-10)
COM3 RS-232/422/RS485 select	JP4	3-pin header
CompactFlash® master/slave select	SW1	2-position switch
LCD voltage select	JP2	3-pin header

The PM-US15W CPU board has three onboard jumpers (**Figure 4-3**).

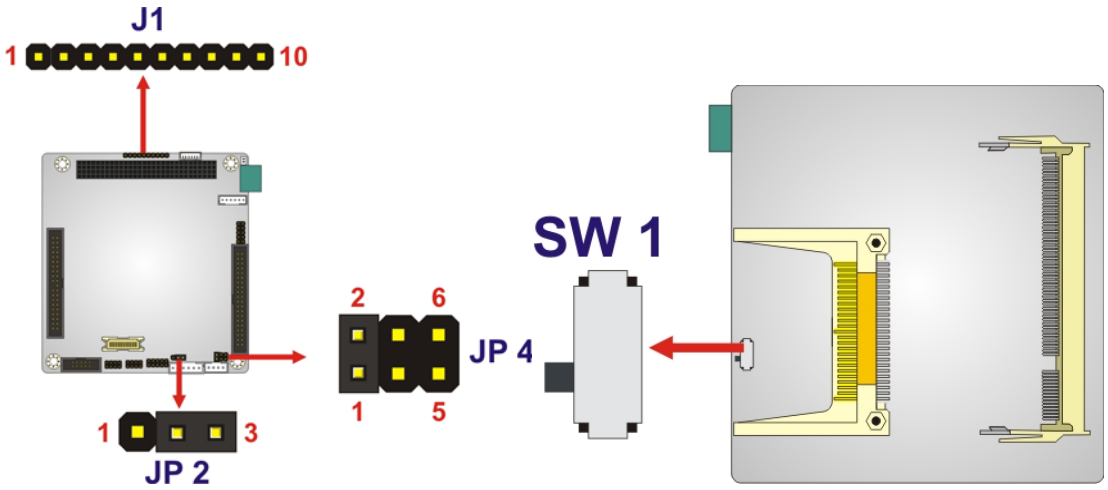


Figure 4-3: Jumper Locations

NOTE:

The PM-US15W does not provide a “Clear CMOS” configuration jumper. If the system fails to boot due to improper BIOS settings, reset the CMOS contents by disconnecting and reconnecting the BT1 battery connector. Use small-sized needle nose pliers to carefully disconnect and reconnect the BT1 battery connector.

4.6.1 AT/ATX Power Select Jumper Settings

Jumper Label: **J1**

Jumper Type: 10-pin header (pins 9-10)

Jumper Settings: See **Table 4-1**

Jumper Location: See **Figure 4-4**

The AT Power Select jumper specifies the systems power mode as AT or ATX. Use a jumper cap to short pins 9 and 10 for ATX mode. The pins remain open for AT mode.

Setting	Description
Short 9-10	ATX power mode (default)
Open 9-10	AT power mode

Table 4-1: AT/ATX Power Select Jumper Settings

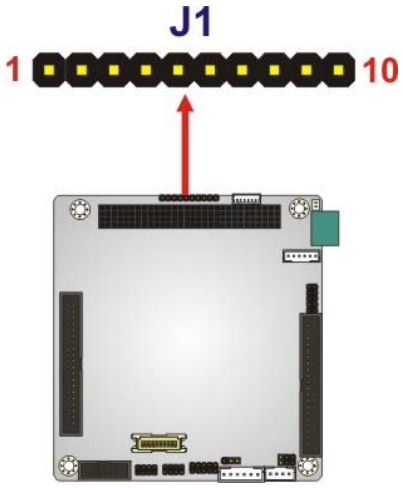


Figure 4-4: AT/ATX Power Select Jumper Location

4.6.2 COM3 RS-232/422/RS485 Select Jumper

Jumper Label: JP4

Jumper Type: 6-pin (2x3) header

Jumper Location: See **Figure 4-5**

Jumper Settings: See **Table 4-2**

The **COM3 RS-232/422/RS485 Select** jumper sets the COM3 connector type to RS-232, RS-422 or RS-485.

Setting	DESCRIPTION
1-2	RS-232 (Default)
3-4	RS-422
5-6	RS-485

Table 4-2: COM3 RS-232/422/RS485 Select Jumper Settings

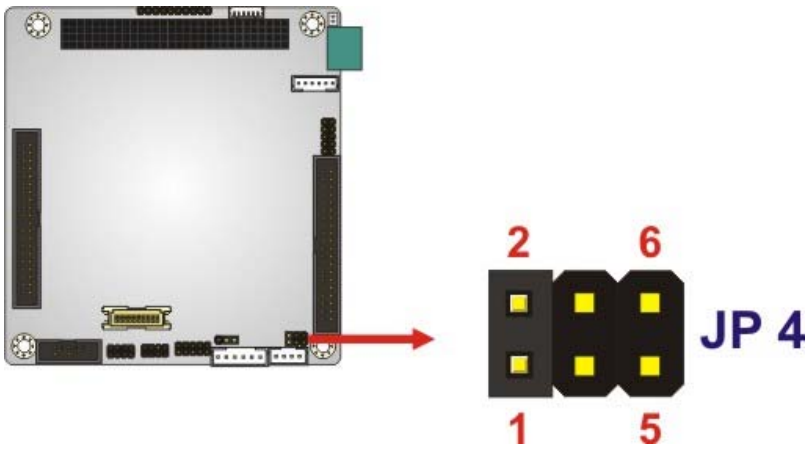


Figure 4-5: COM3 RS-232/422/RS485 Select Jumper Location

4.6.3 CompactFlash® Master/Slave Select Switch

Jumper Label: **SW1**

Jumper Type: 2-position switch

Jumper Settings: See **Table 4-3**

Jumper Location: See **Figure 4-6**

The CompactFlash® slot is connected through an IDE connection. This switch sets the CompactFlash® card as the master or slave IDE device.

Setting	Description
1	Slave (default)
2	Master

Table 4-3: CompactFlash® Setup Jumper Settings

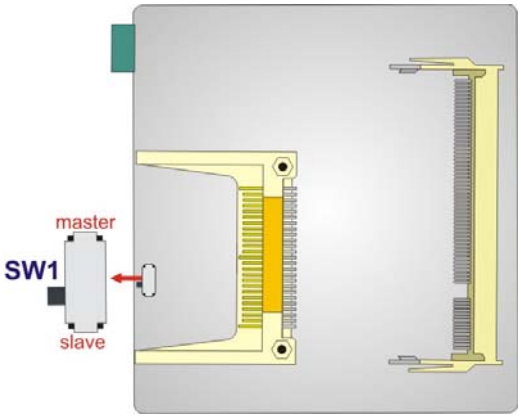


Figure 4-6: CompactFlash® Setup Jumper Location

4.6.4 LCD Panel Voltage Select Jumper

Jumper Label: JP2

Jumper Type: 3-pin header

Jumper Location: See **Figure 4-7**

Jumper Settings: See **Table 4-4**

The **LCD Panel Voltage Select** jumper sets the LCD voltage to 3.3V or 5V.

Setting	DESCRIPTION
1-2	LCD Panel Voltage 3.3V (Default)
2-3	LCD Panel Voltage 5V

Table 4-4: LCD Panel Voltage Select Jumper Settings

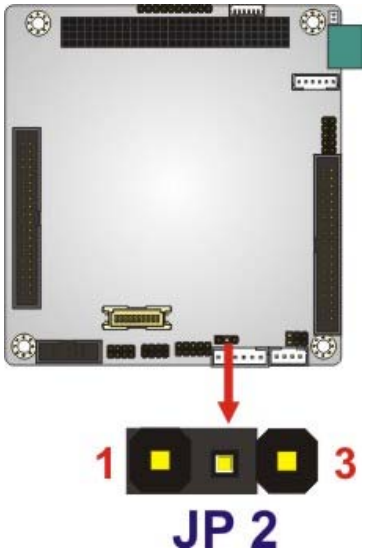


Figure 4-7: LCD Voltage Select Jumper Location

4.7 Chassis Installation

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the PM-US15W must have air vents to allow cool air to move into the system and hot air to move out.

The PM-US15W must be installed in a chassis with ventilation holes on the sides allowing air to flow through the heat sink surface. In a system with an individual power supply unit, the power supply cooling fan can also help generate airflow through the board surface.

NOTE:

IEI has a wide range of backplanes available. Please contact your vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (http://www.ieiworld.com.tw) to find out more about the available chassis.

4.8 Internal Peripheral Device Connections

The cables listed in **Table 4-5** are shipped with the PM-US15W.

Quantity	Type
1	ATA/33 flat cable
1	Single RS-232 cable w/o bracket
1	KB/MS PS/2 Y-cable
1	Dual USB cable w/o bracket
1	LAN cable
1	Power cable
1	VGA cable

Table 4-5: IEI Provided Cables

Separately purchased optional IEI items that can be installed are listed below:

- 7.1 channel HD audio kit
- FDD cable
- LPT cable
- RS-422/485 cable

For more details about the items listed above, please refer to **Chapter 2.4**. Installation of the accessories listed above is described in detail below.

4.8.1 7.1 Channel Audio Kit Installation

NOTE:

This item must be ordered separately, and connects to the audio connector. For further information please contact the nearest distributor, reseller or vendor or contact an iEi sales representative directly. Send any queries to sales@iei.com.tw.

The audio kit attaches to the audio connector. The audio kit provides 7.1 channel audio. To install the audio kit, please refer to the steps below:

Step 1: **Connect the cable to the audio kit.** Connect the included cable to the audio kit. Make sure pin 1 aligns with the marked pin.

Step 2: **Conect the cable to the board**. Connect the other end of the cable to the board. Make sure to line up the marked pin 1.

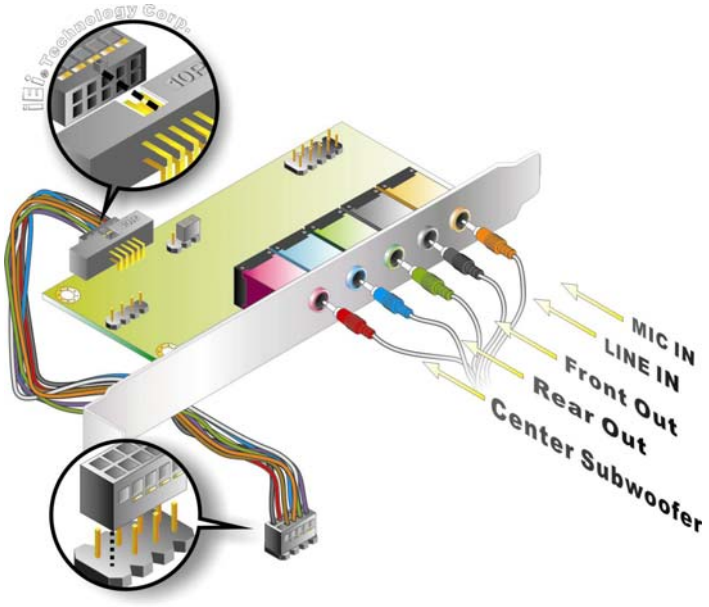


Figure 4-8: 7.1 Channel Audio Kit

Step 3: **Mount the audio kit onto the chassis**. Once the audio kit is connected to the board, secure the audio kit bracket to the system chassis.

Step 4: **Connect the audio devices**. Connect speakers and external audio sources to the audio jacks on the audio kit.

Step 5: **Install the driver**. Install the 7.1 channel audio driver included with the board.

4.8.2 ATA Flat Cable Connection

The ATA/33 flat cable connects to the PM-US15W to one or two IDE devices. To connect an IDE HDD to the PM-US15W, please follow the instructions below:

Step 1: **Locate the IDE connector**. The location of the IDE device connector is shown in **Section 3.1.1**.

Step 2: **Insert the connector**. Connect the IDE cable connector to the onboard connector. See **Figure 4-9**. A key on the front of the cable connector ensures it can only be inserted in one direction.

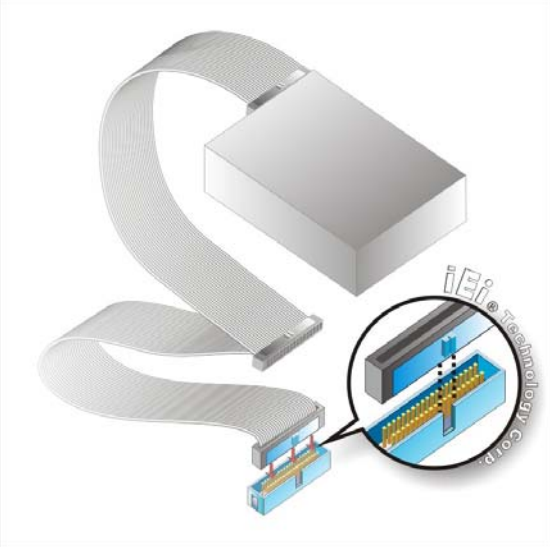


Figure 4-9: IDE Cable Connection

Step 3: **Connect the cable to an IDE device**. Connect the two connectors on the other side of the cable to one or two IDE devices. Make sure that pin 1 on the cable corresponds to pin 1 on the connector

4.8.3 Keyboard/Mouse Y-cable Connector

The PM-US15W-R11 is shipped with a keyboard/mouse Y-cable connector. The keyboard/mouse Y-cable connector connects to a keyboard/mouse connector on the PM-US15W-R11 and branches into two cables that are each connected to a PS/2

connector, one for a mouse and one for a keyboard. To connect the keyboard/mouse Y-cable connector, please follow the steps below.

Step 1: **Locate the connector**. The location of the keyboard/mouse Y-cable connector is shown in **Section 3.1.1**.

Step 2: **Align the connectors**. Correctly align pin 1 on the cable connector with pin 1 on the PM-US15W-R11 keyboard/mouse connector. See **Figure 4-10**.

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the keyboard/mouse connector on the PM-US15W-R11, connect the cable connector to the onboard connectors. See **Figure 4-10**.

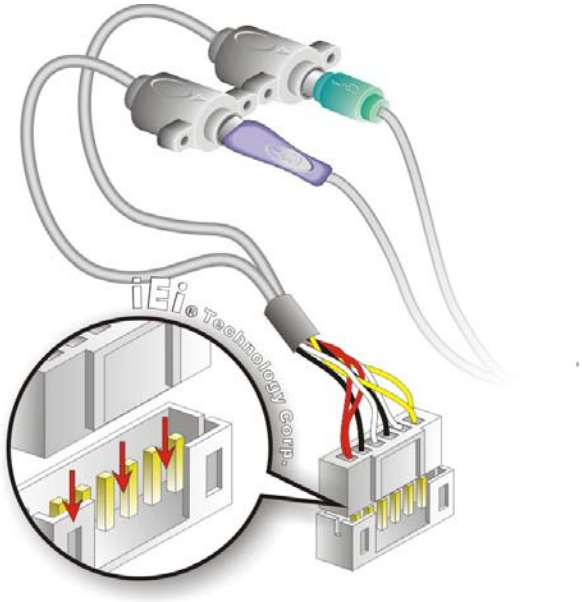


Figure 4-10: Keyboard/mouse Y-cable Connection

Step 4: **Attach PS/2 connectors to the chassis**. The keyboard/mouse Y-cable connector is connected to two PS/2 connectors. To secure the PS/2 connectors to the chassis please refer to the installation instructions that came with the chassis.

Step 5: **Connect the keyboard and mouse**. Once the PS/2 connectors are connected to the chassis, a keyboard and mouse can each be connected to one of the

PS/2 connectors. The keyboard PS/2 connector and mouse PS/2 connector are both marked. Please make sure the keyboard and mouse are connected to the correct PS/2 connector.

4.8.4 Parallel Port Cable without Bracket

The optional parallel port (LPT) cable respectively connects the onboard LPT 26-pin box header to an external LPT device (like a printer). The cable comprises a 26-pin female header, to be connected to the onboard LPT box-header, on one side and on the other side a standard external LPT connector. To connect the LPT cable, please follow the steps below.

Step 1: **Locate the connector**. The LPT connector location is shown in **Section 3.1.1**.

Step 2: **Align the connectors**. Correctly align pin 1 on the cable connector with pin 1 on the PCIE-9452 LPT box-header connector. See **Figure 4-11**.

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the 26-pin box-header connector on the PCIE-9452, connect the cable connector to the onboard connector. See **Figure 4-11.**

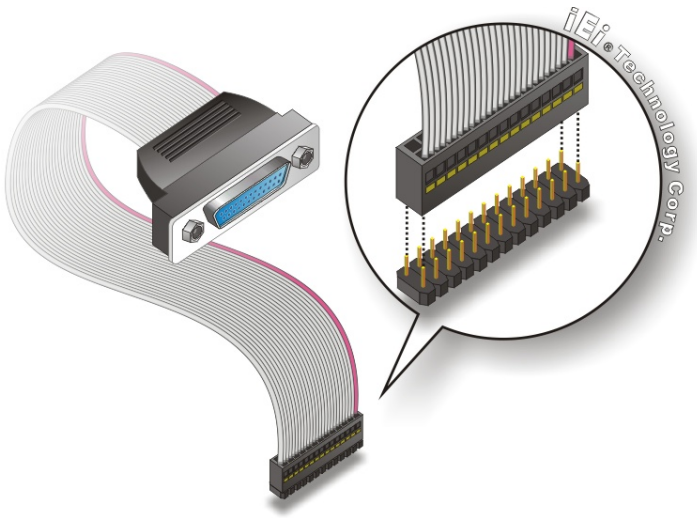


Figure 4-11: LPT Cable Connection

Step 4: **Attach the LPT connector to the chassis**. To secure the LPT interface connector to the chassis please refer to the installation instructions that came

with the chassis.

Step 5: **Connect LPT device**. Once the LPT interface connector is connected to the chassis, the LPT device can be connected to the LPT interface connector. See **Figure 4-12**

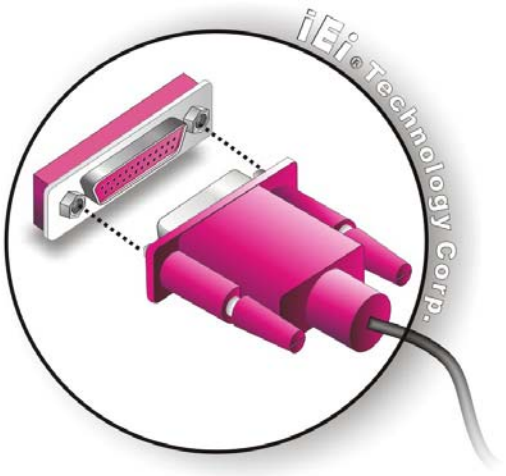


Figure 4-12: Connect the LPT Device

4.8.5 Single RS-232 Cable (without Bracket)

The single RS-232 cable consists of one serial port connector attached to a serial communications cable that is then attached to a D-sub 9 male connector. To install the single RS-232 cable, please follow the steps below.

Step 1: **Locate the connector**. The location of the RS-232 connector is shown in **Section 3.1.1**.

Step 2: **Insert the cable connector**. Insert the connector into the serial port box header. See **Figure 4-13.** A key on the front of the cable connectors ensures the connector can only be installed in one direction.

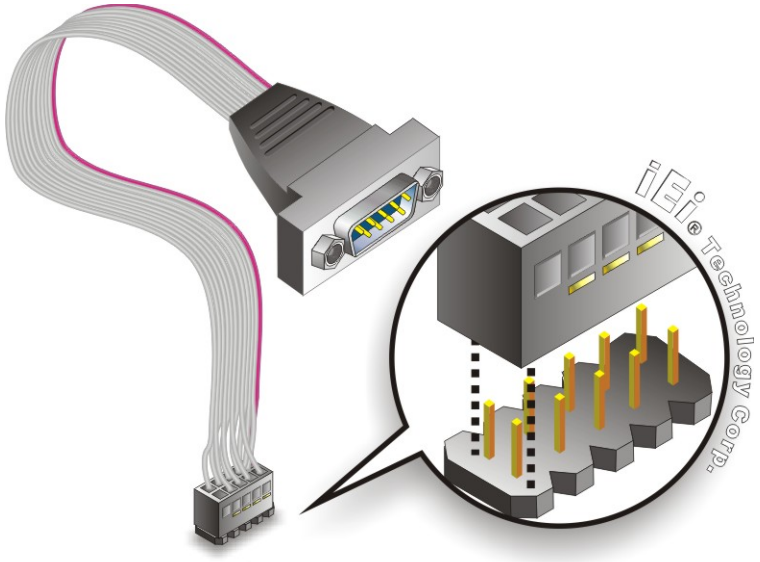


Figure 4-13: Single RS-232 Cable Installation

Step 3: **Secure the bracket**. The single RS-232 connector has two retention screws that must be secured to a chassis or bracket.

Step 4: **Connect the serial device**. Once the single RS-232 connector is connected to a chassis or bracket, connect a serial communications device to the chassis or bracket.

4.8.6 TFT LCD Installation

The PM-US15W-R11 can be connected to a TFT LCD screen through the 40-pin TTL screen on the board. To connect a TFT LCD to the PM-US15W, please follow the steps below.

Step 5: **Locate the connector**. The location of the TTL connector is shown in **Section 3.1.1**.

Step 6: **Insert the cable connector**. Insert the connector from the TTL PCB driving board to the TTL connector as shown in **Figure 4-14**. When connecting the connectors, make sure the pins are properly aligned.

WARNING:

The diagram below is merely for illustration. The configuration and connection of the cables from the TFT LCD screen being installed may be different. Please refer to the installation manual that came with the TFT LCD screen.

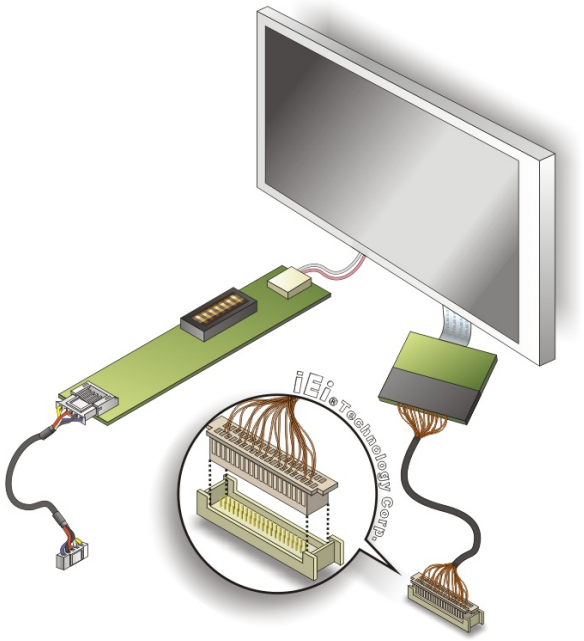


Figure 4-14: TTL Connector

Step 7: **Locate the backlight inverter connector.** The location of the backlight inverter connector is shown in **Section 3.1.1**.

Step 8: **Connect backlight connector**. Connect the backlight connector to the driver TFT LCD PCB as shown in **Figure 4-15**. When inserting the cable connector, make sure the pins are properly aligned.

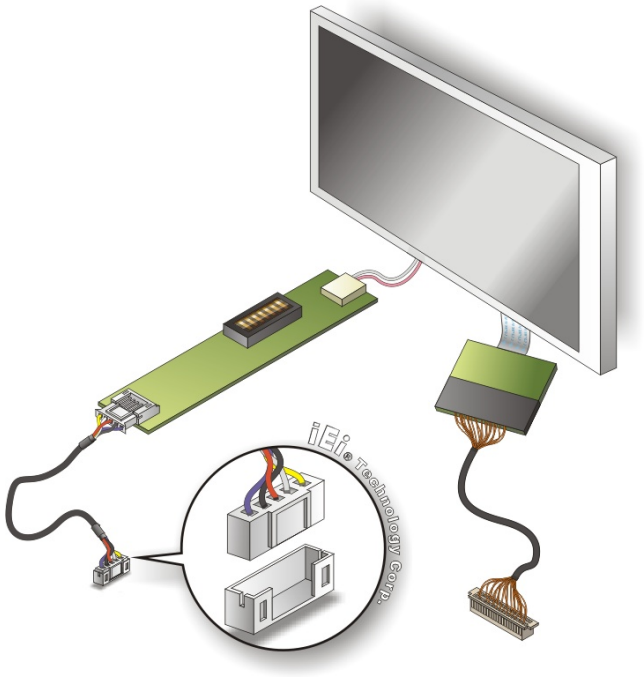


Figure 4-15: Backlight Inverter Connection

4.9 Software Installation

All the drivers for the PM-US15W are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 9: Insert the CD into a CD drive connected to the system.

NOTE:

If the installation program doesn't start automatically:
Click "Start->My Computer->CD Drive->autorun.exe"

Step 10: The driver main menu appears (**Figure 4-16**).

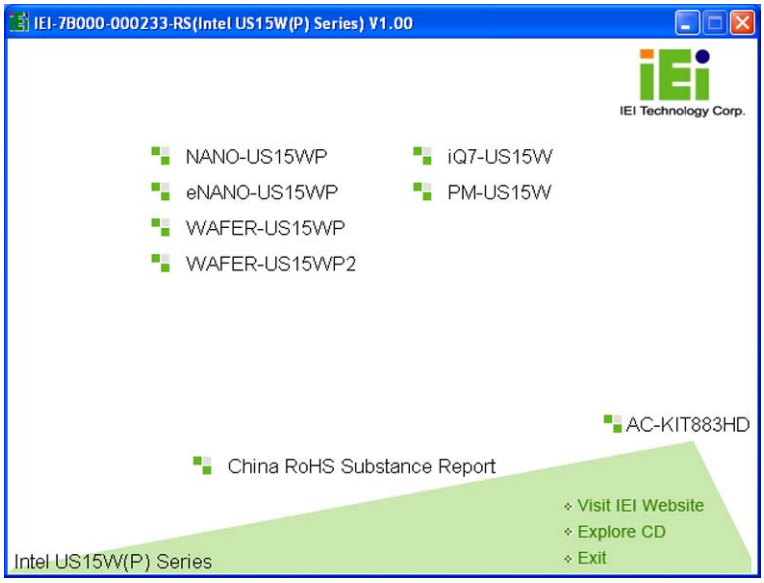


Figure 4-16: Introduction Screen

Step 11: Click PM-US15W.

Step 12: A new screen with a list of available drivers appears (**Figure 4-17**).

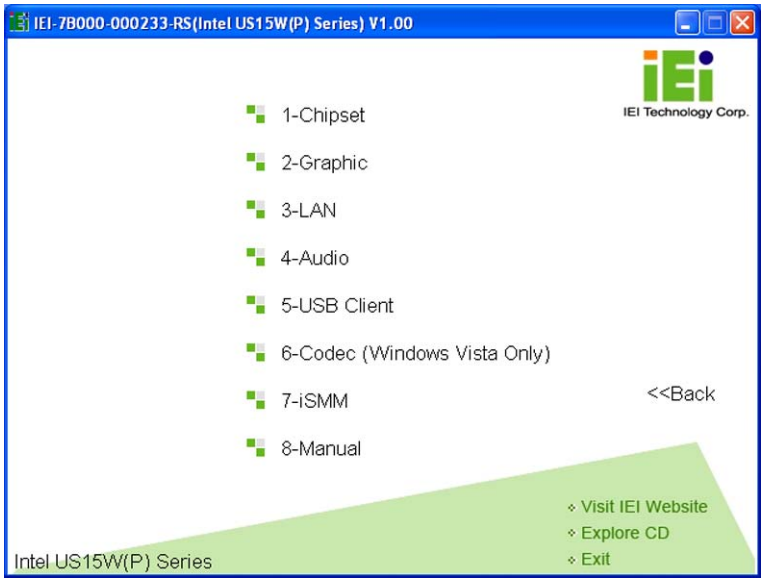


Figure 4-17: Available Drivers

Step 13: Install all of the necessary drivers in this menu.

Chapter

5

BIOS

5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

5.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu

Key	Function
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter **5**.

5.1.5 BIOS Menu Bar

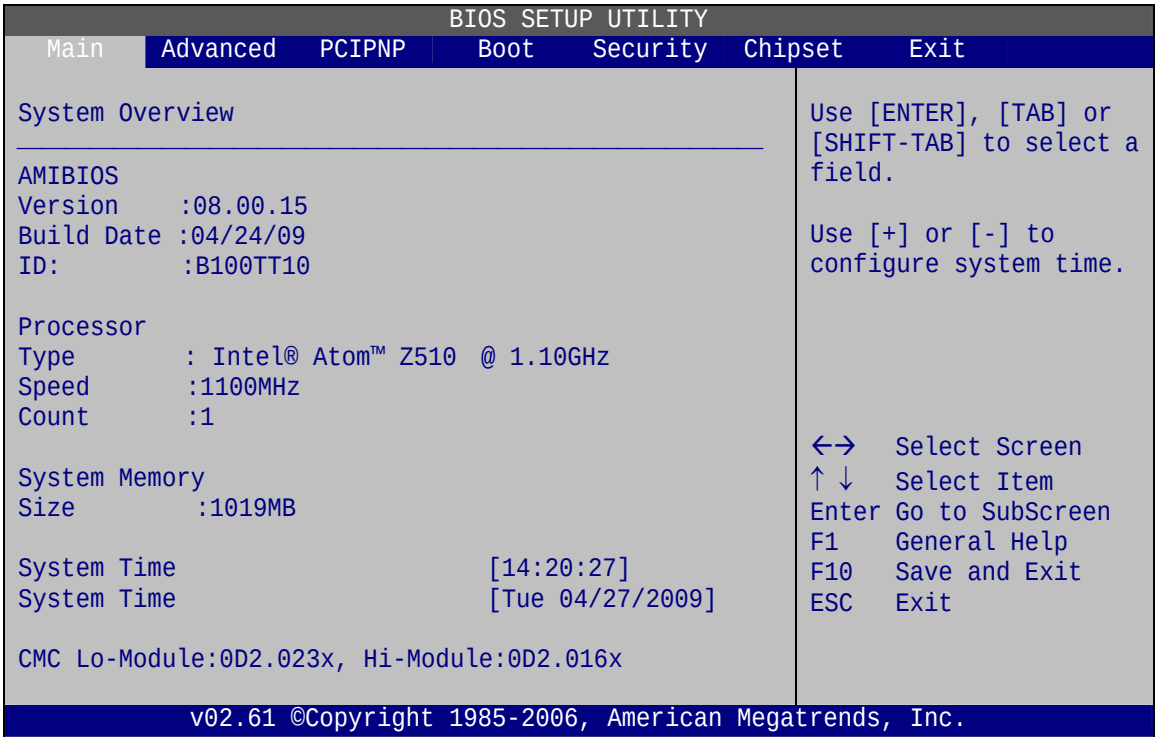
The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- PCIPnP – Changes the advanced PCI/PnP Settings
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Chipset – Changes the chipset settings.
- Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- AMI BIOS: Displays auto-detected BIOS information
  - **Version:** Current BIOS version
  - **Build Date:** Date the current BIOS version was made
  - **ID:** Installed BIOS ID
- Processor: Displays auto-detected CPU specifications
  - **Type:** Names the currently installed processor
  - **Speed:** Lists the processor speed
  - **Count:** The number of CPUs on the motherboard

- System Memory: Displays the auto-detected system memory.
  - **Size:** Lists memory size

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

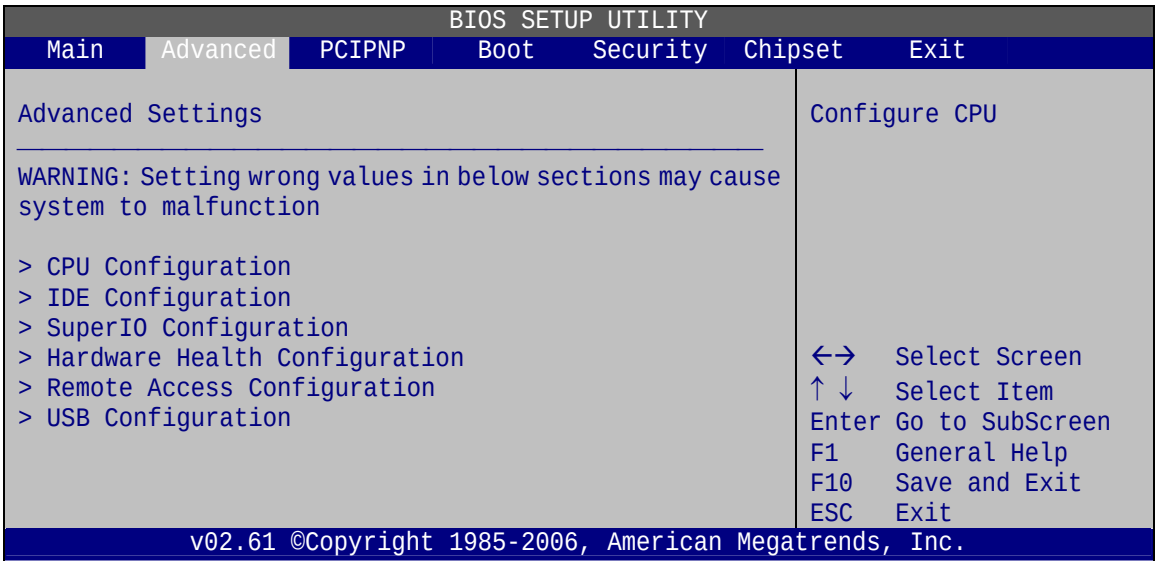
5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING!

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

- CPU Configuration (see **Section 5.3.1**)
- IDE Configuration (see **Section 5.3.2**)
- Floppy Configuration (see **Section 5.3.3**)
- Super I/O Configuration (see **Section 5.3.3**)
- Hardware Health Configuration (see **Section 5.3.4**)
- Remote Access Configuration (see **Section 5.3.5**)
- USB Configuration (see **Section 5.3.6**)


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Advanced Settings
WARNING: Setting wrong values in below sections may cause system to malfunction
> CPU Configuration
> IDE Configuration
> SuperIO Configuration
> Hardware Health Configuration
> Remote Access Configuration
> USB Configuration
Configure CPU
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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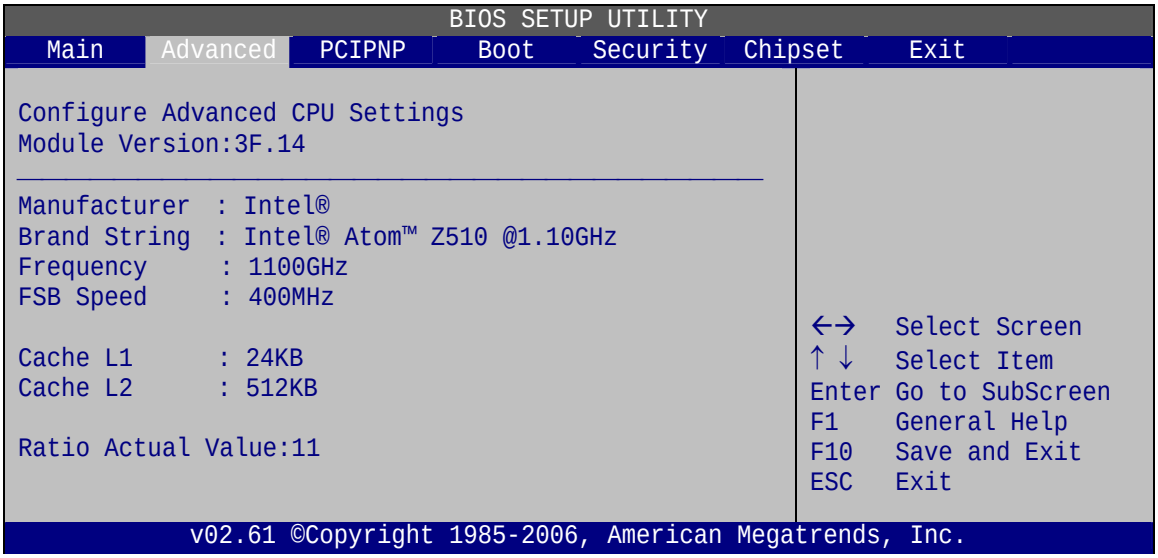
BIOS Menu 2: Advanced

5.3.1 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.



BIOS Menu 3: CPU Configuration

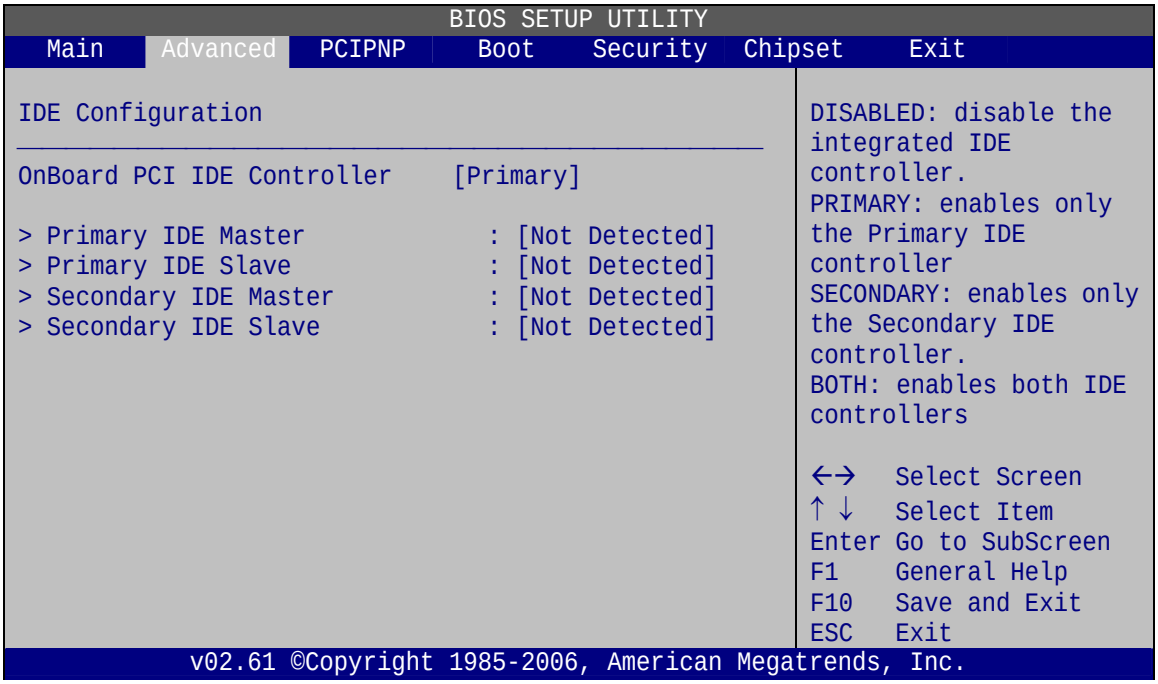
The CPU Configuration menu (**BIOS Menu 3**) lists the following CPU details:

- Manufacturer: Lists the name of the CPU manufacturer

- Brand String: Lists the brand name of the CPU being used
- Frequency: Lists the CPU processing speed
- Cache L1: Lists the CPU L1 cache size
- Cache L2: Lists the CPU L2 cache size

5.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
IDE Configuration
OnBoard PCI IDE Controller [Primary]
> Primary IDE Master : [Not Detected]
> Primary IDE Slave : [Not Detected]
> Secondary IDE Master : [Not Detected]
> Secondary IDE Slave : [Not Detected]
DISABLED: disable the integrated IDE controller.
PRIMARY: enables only the Primary IDE controller
SECONDARY: enables only the Secondary IDE controller.
BOTH: enables both IDE controllers
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 4: IDE Configuration

➔ **ATA/IDE Configurations [Compatible]**

Use the **ATA/IDE Configurations** option to configure the ATA/IDE controller.

➔ **Disabled**	Disables the on-board ATA/IDE controller.
➔ **Compatible**	Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.

➔ **Enhanced** **DEFAULT** Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

➔ **Configure SATA as [IDE]**

Use the **Configure SATA as** option to configure SATA devices as normal IDE devices.

➔ **IDE** **DEFAULT** Configures SATA devices as normal IDE device.

➔ **Configure SATA Channels [Behind PATA]**

Use the **Configure SATA Channels** option to determine how SATA channels and PATA channels are ordered.

➔ **Before PATA** Puts SATA channels before PATA channels.

➔ **Behind PATA** **DEFAULT** Puts SATA channels behind PATA channels.

➔ **Legacy IDE Channels [PATA Pri, SATA Sec]**

➔ **SATA Only** Only the SATA drives are enabled.

➔ **PATA Pri, SATA Sec** **DEFAULT** The IDE drives are enabled on the Primary IDE channel. The SATA drives are enabled on the Secondary IDE channel.

➔ **PATA Pri., PATA Sec** The IDE drives are enabled on the primary and secondary IDE channels. SATA drives are disabled.

➔ **OnBoard PCI IDE Controller [Both]**

Use the **OnBoard PCI IDE Controller** BIOS option to specify the IDE channels used by the onboard PCI IDE controller. The following configuration options are available.

➔ **Disabled** Prevents the system from using the onboard IDE controller

➔ **Primary** Only allows the system to detect the Primary IDE channel, including both the Primary Master and the Primary Slave

➔ **Secondary** Only allows the system to detect the Secondary IDE channel, including both the Secondary Master and Secondary Slave

➔ **Both** **DEFAULT** Allows the system to detect both the Primary and Secondary IDE channels including the Primary Master, Primary Slave, Secondary Master and Secondary Slave.

➔ **IDE Master and IDE Slave**

When entering setup, BIOS automatically detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 5.3.2.1** appear.

➔ **Hard Disk Write Protect [Disabled]**

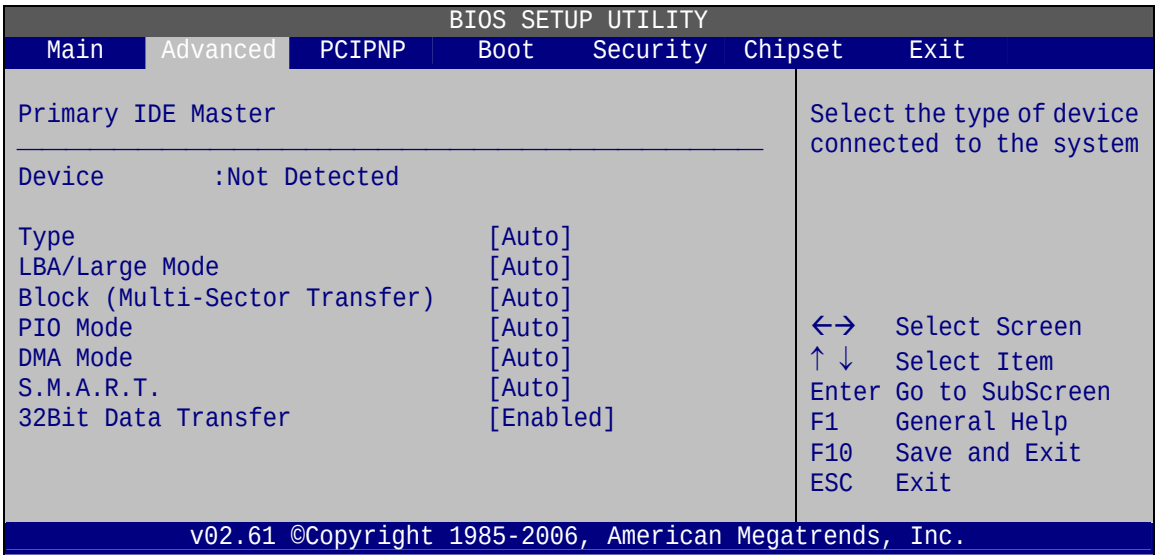
Use the **Hard Disk Write Protect** BIOS option to protect the hard disks from being overwritten. This menu item is only effective if the device is accessed through the BIOS.

➔ **Disabled** **DEFAULT** Allows hard disks to be overwritten

➔ **Enabled** Prevents hard disks from being overwritten

5.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The “grayed-out” items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- Device: Lists the device type (e.g. hard disk, CD-ROM etc.)
- Type: Indicates the type of devices a user can manually select
- Vendor: Lists the device manufacturer
- Size: List the storage capacity of the device.
- LBA Mode: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- Block Mode: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per

interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.

- PIO Mode: Indicates the PIO mode of the installed device.
- Async DMA: Indicates the highest Asynchronous DMA Mode that is supported.
- Ultra DMA: Indicates the highest Synchronous DMA Mode that is supported.
- S.M.A.R.T.: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- 32Bit Data Transfer: Enables 32-bit data transfer.

➔ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed**		BIOS is prevented from searching for an IDE disk drive on the specified channel.
➔ **Auto**	**DEFAULT**	The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
➔ **CD/DVD**		The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
➔ **ARMD**		This option specifies an ATAPI Removable Media Device. These include, but are not limited to: ZIP LS-120

➔ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled** BIOS is prevented from using the LBA mode control on the specified channel.

➔ **Auto** **DEFAULT** BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled** BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.

➔ **Auto** **DEFAULT** BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto** **DEFAULT** BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.

➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3 MB/s

➔ **1** PIO mode 1 selected with a maximum transfer rate of 5.2 MB/s

➔ **2** PIO mode 2 selected with a maximum transfer rate of 8.3 MB/s

➔ **3** PIO mode 3 selected with a maximum transfer rate of 11.1 MB/s

➔ **4**		PIO mode 4 selected with a maximum transfer rate of 16.6 MB/s (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

➔ **Auto**	**DEFAULT**	BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
➔ **SWDMA0**		Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1 MB/s
➔ **SWDMA1**		Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2 MB/s
➔ **SWDMA2**		Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3 MB/s
➔ **MWDMA0**		Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2 MB/s
➔ **MWDMA1**		Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3 MB/s
➔ **MWDMA2**		Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6 MB/s
➔ **UDMA0**		Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6 MB/s
➔ **UDMA1**		Ultra DMA mode 1 selected with a maximum data transfer rate of 25 MB/s
➔ **UDMA2**		Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3 MB/s

- ➔ **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)
- ➔ **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)
- ➔ **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

- ➔ **Auto** **DEFAULT** BIOS auto detects HDD SMART support.
- ➔ **Disabled** Prevents BIOS from using the HDD SMART feature.
- ➔ **Enabled** Allows BIOS to use the HDD SMART feature

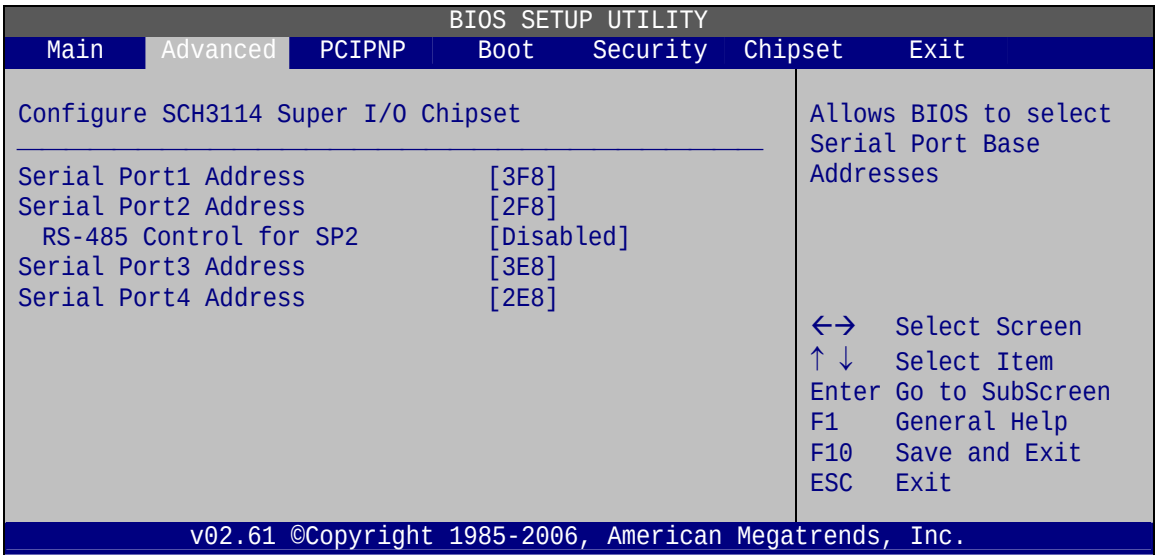
➔ **32Bit Data Transfer [Enabled]**

Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

- ➔ **Disabled** Prevents the BIOS from using 32-bit data transfers.
- ➔ **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.

5.3.3 Super I/O Configuration

Use the **Super I/O Configuration** menu (**BIOS Menu 6**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Configure SCH3114 Super I/O Chipset
Serial Port1 Address [3F8]
Serial Port2 Address [2F8]
RS-485 Control for SP2 [Disabled]
Serial Port3 Address [3E8]
Serial Port4 Address [2E8]
Allows BIOS to select Serial Port Base Addresses
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 6: Super IO Configuration

➔ **Serial Port1 Address [3F8]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔ **Disabled**		No base address is assigned to Serial Port 1
➔ **3F8**	**DEFAULT**	Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4
➔ **3E8**		Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8**		Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Address [2F8]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

➔ **Disabled**		No base address is assigned to Serial Port 2
➔ **2F8**	**DEFAULT**	Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3

- ➔ **3E8** Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
- ➔ **2E8** Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **RS-485 Control for SP2 [Disabled]**

Use the **RS-485 Control for SP2** option to enable or disable the Serial Port 2 RS-485 signaling mode.

- ➔ **Disabled** **DEFAULT** Serial Port 2 RS-485 signaling mode is disabled
- ➔ **Enabled** Serial Port 2 RS-485 signaling mode is enabled

➔ **Serial Port3 Address [3E8]**

Use the **Serial Port3 Address** option to select the base addresses for serial port 3.

- ➔ **Disabled** No base address is assigned to serial port 3
- ➔ **3F8** Serial port 3 I/O port address is 3F8
- ➔ **2F8** Serial port 3 I/O port address is 2F8
- ➔ **3E8** **DEFAULT** Serial port 3 I/O port address is 3E8
- ➔ **2E8** Serial port 3 I/O port address is 2E8

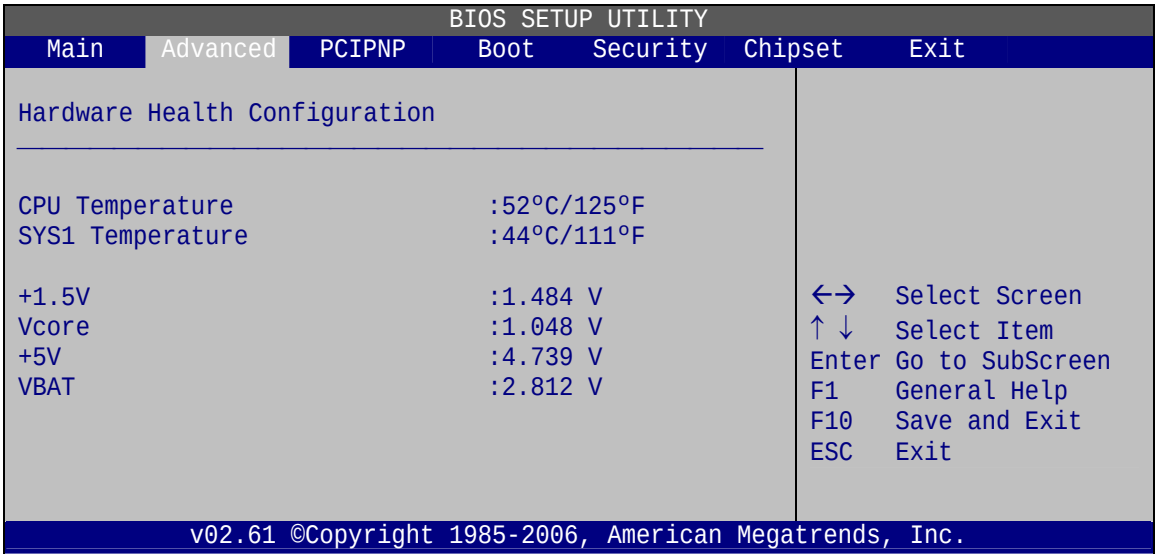
➔ **Serial Port4 Address [2E8]**

Use the **Serial Port4 Address** option to select the base addresses for serial port 4.

- ➔ **Disabled** No base address is assigned to serial port 3
- ➔ **3F8** Serial port 3 I/O port address is 3F8
- ➔ **2F8** Serial port 3 I/O port address is 2F8
- ➔ **3E8** Serial port 3 I/O port address is 3E8
- ➔ **2E8** **DEFAULT** Serial port 3 I/O port address is 2E8

5.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 7**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 7: Hardware Health Configuration

➔ **Hardware Health Monitoring**

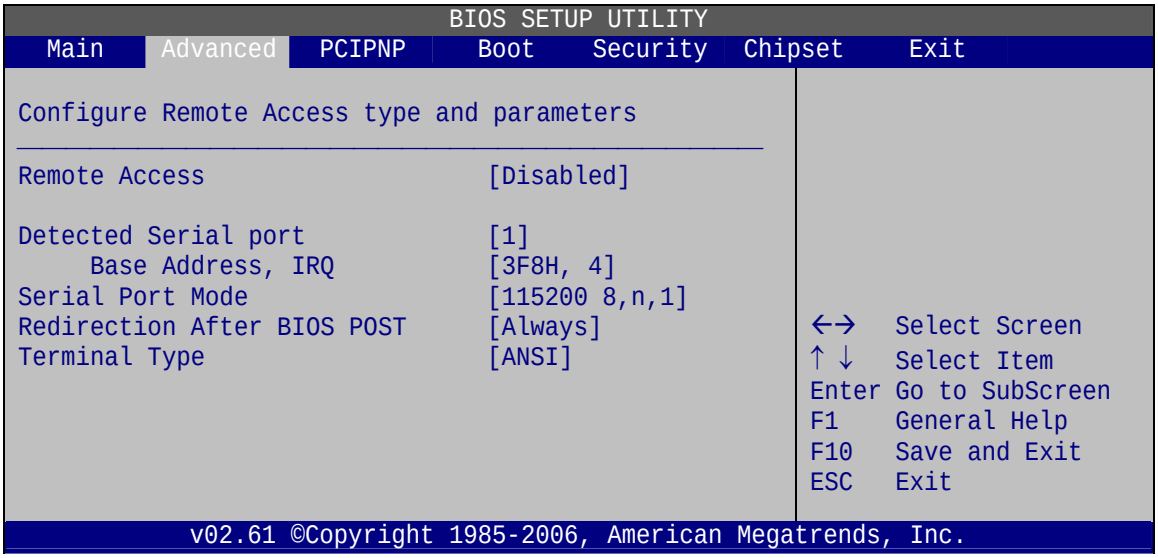
The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
  - CPU Temperature
  - System Temperature
- Voltages:
  - +1.5V
  - Vcore
  - +5Vin
  - VBAT

5.3.5 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 8**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and

allows a remote host running a terminal program to display and configure the BIOS settings.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Configure Remote Access type and parameters
Remote Access [Disabled]
Detected Serial port [1]
Base Address, IRQ [3F8H, 4]
Serial Port Mode [115200 8,n,1]
Redirection After BIOS POST [Always]
Terminal Type [ANSI]
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 8: Remote Access Configuration

➔ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled** **DEFAULT** Remote access is disabled.

➔ **Enabled** Remote access configuration options shown below appear:

- Serial Port Number
- Serial Port Mode
- Flow Control
- Redirection after BIOS POST
- Terminal Type
- VT-UTF8 Combo Key Support

These configuration options are discussed below.

➔ **Detected Serial Port r [1]**

Use the **Detected Serial Port** option to select the serial port used for remote access.

➔	**1**	**DEFAULT**	System is remotely accessed through COM1
➔	**2**		System is remotely accessed through COM2
➔	**3**		System is remotely accessed through COM3

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ **Base Address, IRQ [3F8h,4]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

➔ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

NOTE:

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

➔ **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

➔	**Disabled**		The console is not redirected after POST
➔	**Boot Loader**		Redirection is active during POST and during Boot Loader
➔	**Always**	**DEFAULT**	Redirection is always active (Some OSes may not work if set to Always)

➔ **Terminal Type [ANSI]**

Use the **Terminal Type** BIOS option to specify the remote terminal type.

➔	**ANSI**	**DEFAULT**	The target terminal type is ANSI
➔	**VT100**		The target terminal type is VT100
➔	**VT-UTF8**		The target terminal type is VT-UTF8

5.3.6 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 9**) to read USB configuration information and configure the USB settings.

```
                        BIOS SETUP UTILITY
  Main   Advanced   PCIPNP   Boot   Security   Chipset   Exit

USB Configuration                                  Enables USB host
_____________________________________________      controllers
Module Version – 2.24.3-13.4

USB Devices Enabled:
            None

USB Function                    [Enabled]          ←→   Select Screen
Legacy USB Support              [Enabled]          ↑ ↓  Select Item
USB 2.0 Controller              [Enabled]          Enter Go to SubScreen
USB 2.0 Controller Mode         [HiSpeed]          F1    General Help
                                                   F10   Save and Exit
                                                   ESC   Exit

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```

BIOS Menu 9: USB Configuration

➔ **USB Configuration**

The **USB Configuration** field shows the system USB configuration. The items listed are:

- Module Version: x.xxxxx.xxxxx

➔ **USB Devices Enabled**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ **USB 1.1 Controller [Enabled]**

Use the **USB Function** BIOS option to enable or disable USB function support.

➔ **Disabled**		USB 1.1 controller disabled
➔ **Enabled**	**DEFAULT**	USB 1.1 controller enabled

➔ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

➔ **Disabled**		USB 2.0 controller disabled
➔ **Enabled**	**DEFAULT**	USB 2.0 controller enabled

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Disabled**		Legacy USB support disabled
➔ **Enabled**	**DEFAULT**	Legacy USB support enabled

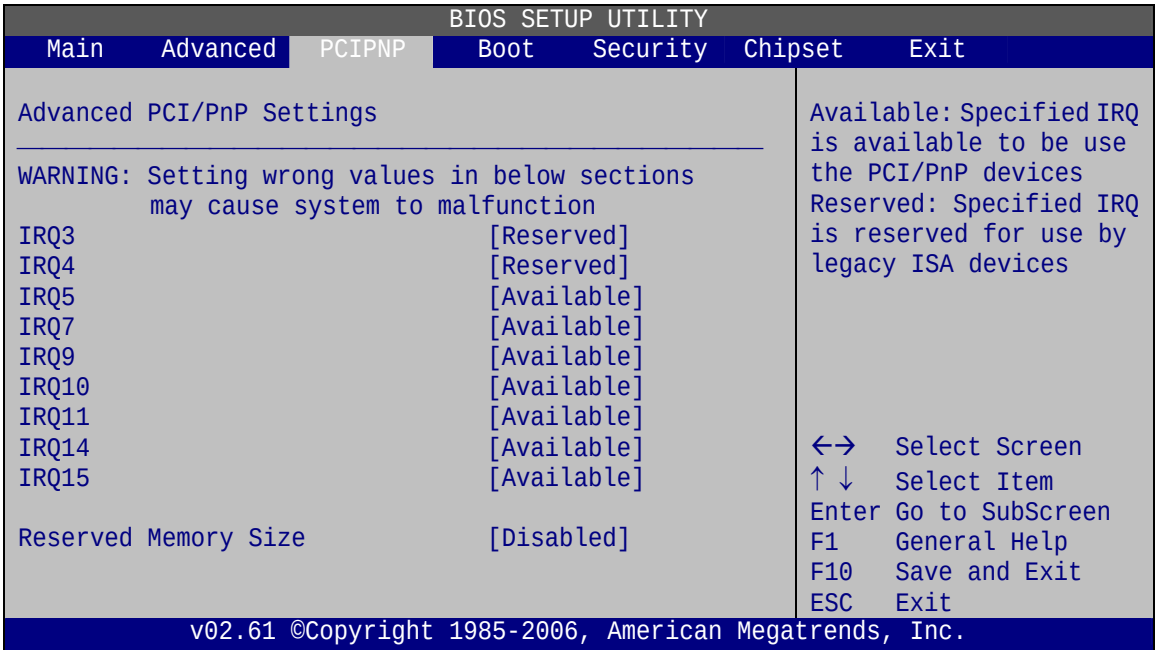
➔ **Auto** Legacy USB support disabled if no USB devices are connected

5.4 PCI/PnP

Use the **PCI/PnP** menu (**BIOS Menu 10**) to configure advanced PCI and PnP settings.

WARNING!

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Advanced PCI/PnP Settings
WARNING: Setting wrong values in below sections may cause system to malfunction
IRQ3 [Reserved]
IRQ4 [Reserved]
IRQ5 [Available]
IRQ7 [Available]
IRQ9 [Available]
IRQ10 [Available]
IRQ11 [Available]
IRQ14 [Available]
IRQ15 [Available]
Reserved Memory Size [Disabled]
Available: Specified IRQ is available to be use the PCI/PnP devices
Reserved: Specified IRQ is reserved for use by legacy ISA devices
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 10: PCI/PnP Configuration

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available** **DEFAULT** The specified DMA is available to be used by PCI/PnP devices

➔ **Reserved** The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

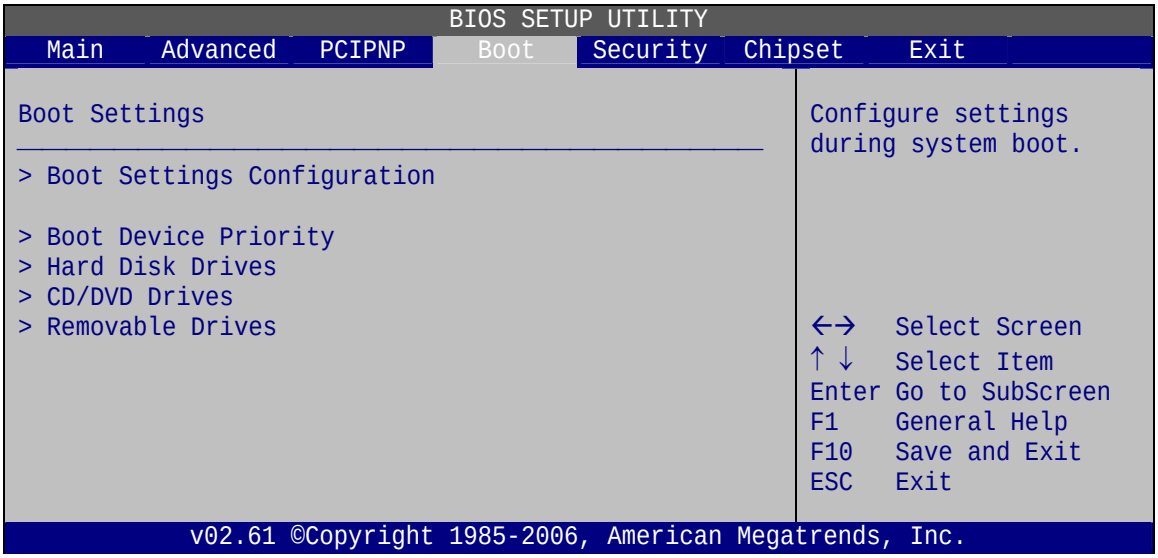
➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔	**Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔	**16K**		16 KB reserved for legacy ISA devices
➔	**32K**		32 KB reserved for legacy ISA devices
➔	**64K**		54 KB reserved for legacy ISA devices

5.5 Boot

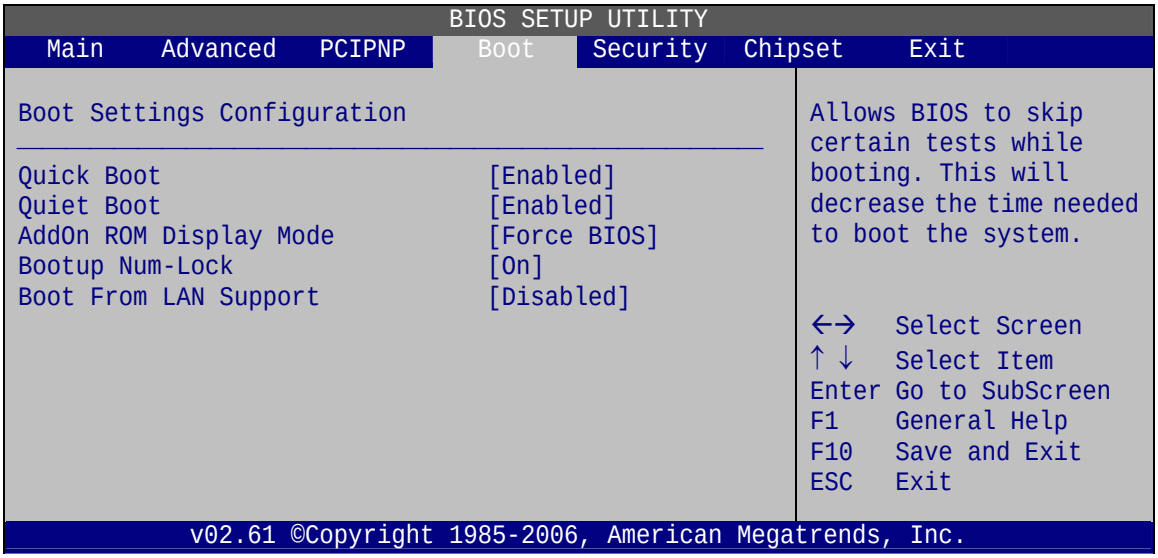
Use the **Boot** menu (**BIOS Menu 11**) to configure system boot options.



BIOS Menu 11: Boot

5.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (**BIOS Menu 12**) to configure advanced system boot options.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Enabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
Boot From LAN Support [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 12: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled** No POST procedures are skipped

➔ **Enabled** **DEFAULT** Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled** **DEFAULT** Normal POST messages displayed

➔ **Enabled** OEM Logo displayed instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS**	**DEFAULT**	The system forces third party BIOS to display during system boot.
➔ **Keep Current**		The system displays normal information during system boot.

➔ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **Off**		Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.
➔ **On**	**DEFAULT**	Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

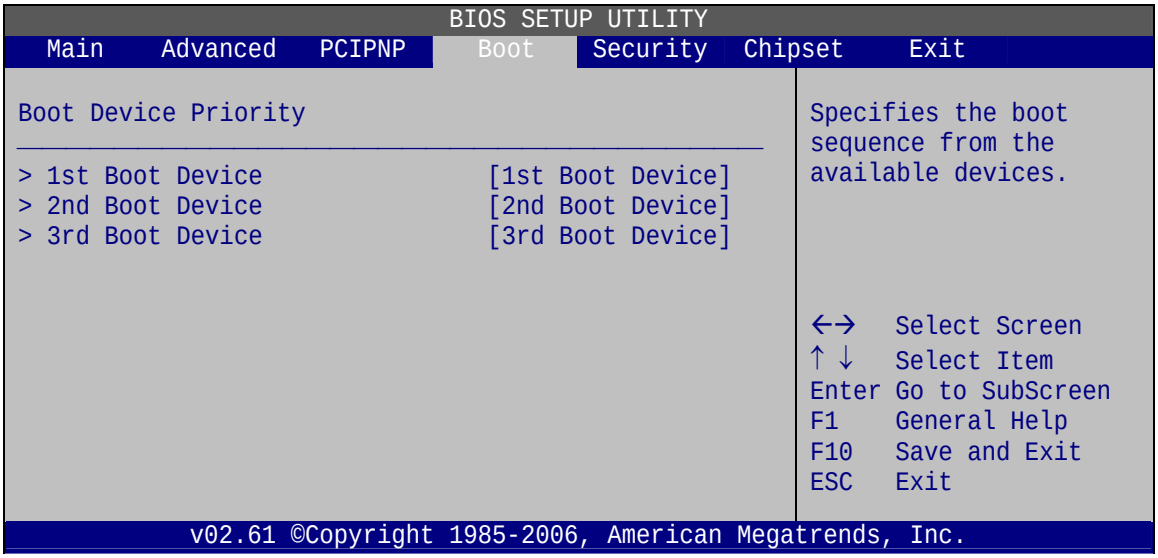
➔ **Boot From LAN Support [Disabled]**

Use the **BOOT From LAN Support** option to enable the system to be booted from a remote system.

➔ **Disabled**	**DEFAULT**	Cannot be booted from a remote system through the LAN
➔ **Enabled**	**DEFAULT**	Can be booted from a remote system through the LAN

5.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 13**) to specify the boot sequence from the available devices. The drive sequence also depends on the boot sequence in the individual device section.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Boot Device Priority
> 1st Boot Device [1st Boot Device]
> 2nd Boot Device [2nd Boot Device]
> 3rd Boot Device [3rd Boot Device]
Specifies the boot sequence from the available devices.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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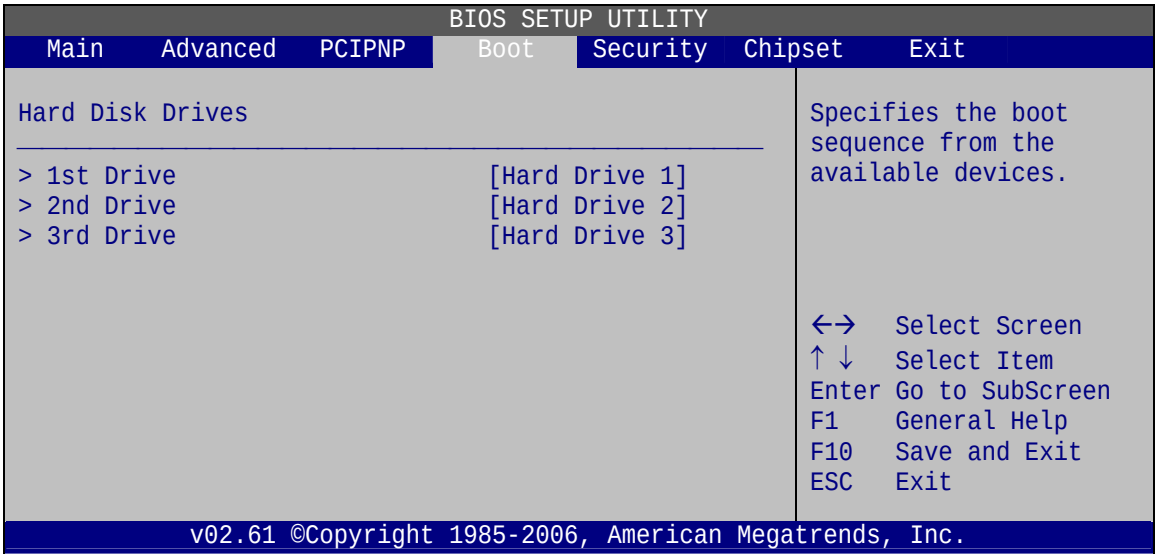
BIOS Menu 13: Boot Device Priority Settings

5.5.3 Hard Disk Drives

Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs. Only installed hard drives are shown.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Hard Disk Drives
> 1st Drive [Hard Drive 1]
> 2nd Drive [Hard Drive 2]
> 3rd Drive [Hard Drive 3]
Specifies the boot sequence from the available devices.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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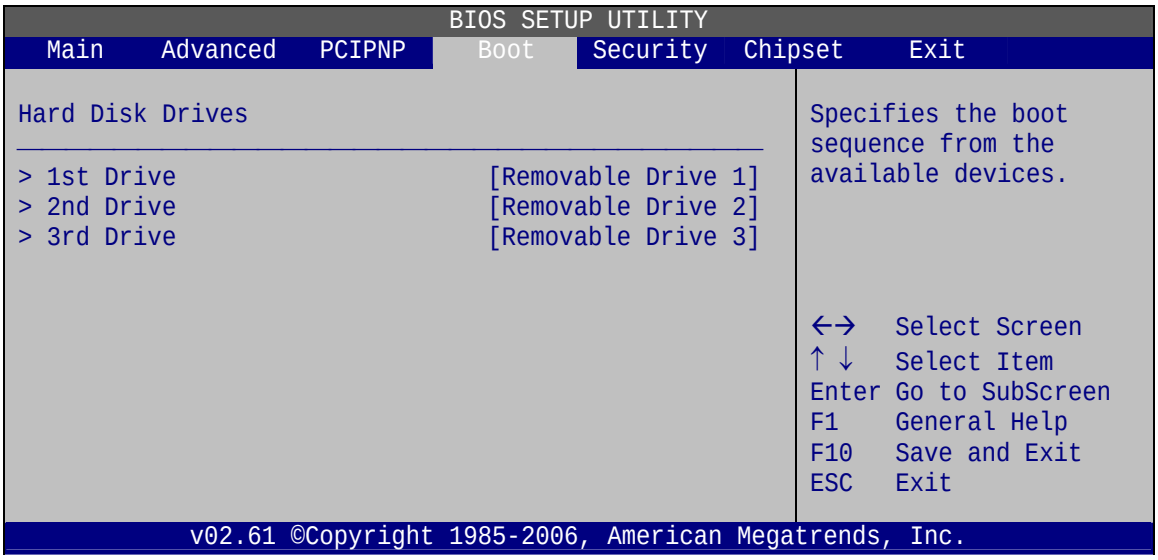
BIOS Menu 14: Hard Disk Drives

5.5.4 Removable Drives

Use the **Removable Drives** menu (**BIOS Menu 15**) to specify the boot sequence of the removable drives. Only connected drives are shown.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Hard Disk Drives
> 1st Drive [Removable Drive 1]
> 2nd Drive [Removable Drive 2]
> 3rd Drive [Removable Drive 3]
Specifies the boot sequence from the available devices.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 15: Removable Drives

5.5.5 CD/DVD Drives

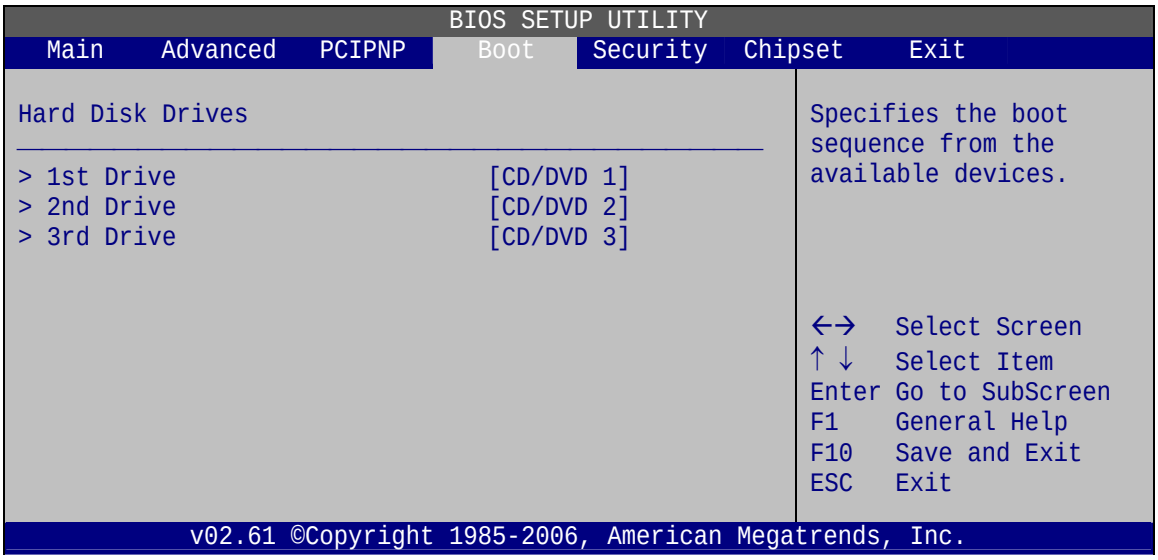
Use the **CD/DVD Drives** menu to specify the boot sequence of the available CD/DVD drives. When the menu is opened, the CD drives and DVD drives connected to the system are listed as shown below:

- 1st Drive [CD/DVD: PM-(part ID)]
- 2nd Drive [HDD: PS-(part ID)]
- 3rd Drive [HDD: SM-(part ID)]
- 4th Drive [HDD: SM-(part ID)]

NOTE:

Only the drives connected to the system are shown. For example, if only two CDs or DVDs are connected only "**1st Drive**" and "**2nd Drive**" are listed.

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available CD/DVD drives is shown. Select the first CD/DVD drive the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Hard Disk Drives
> 1st Drive [CD/DVD 1]
> 2nd Drive [CD/DVD 2]
> 3rd Drive [CD/DVD 3]
Specifies the boot sequence from the available devices.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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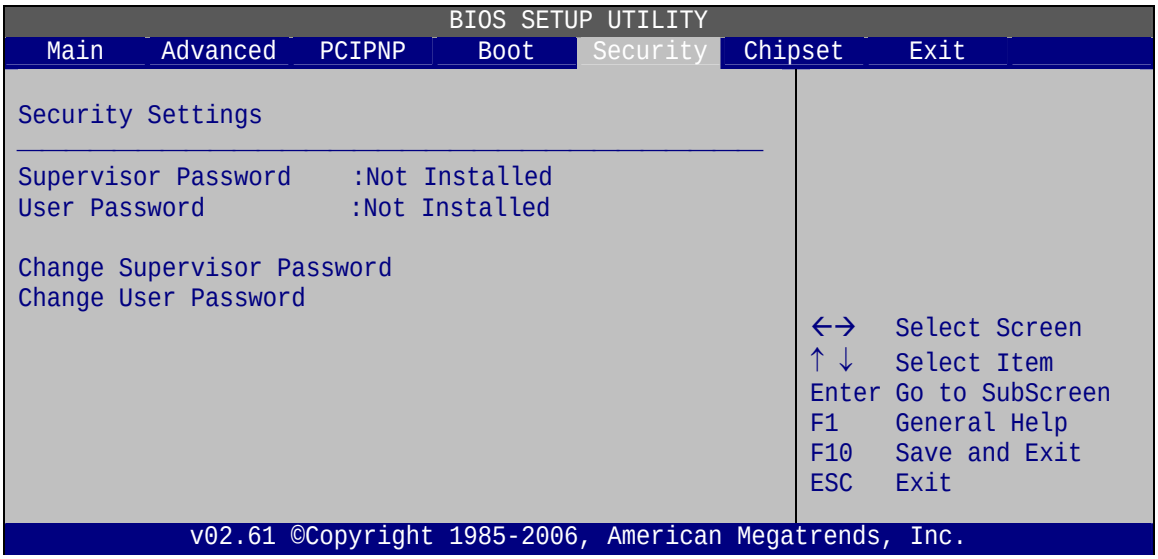
BIOS Menu 16: CD/DVD Drives

5.6 Security

Use the **Security** menu (**BIOS Menu 17**) to set system and user passwords.



BIOS Menu 17: Security

➔ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select

this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ **Change User Password**

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

➔ **Clear User Password**

Use the **Clear User Password** to clear a user's password. The default for this option is **Not Installed**. If a user password must be cleared, use this option.

➔ **Boot Sector Virus Protection [Disabled]**

Use the **Boot Sector Virus Protection** to enable or disable boot sector protection.

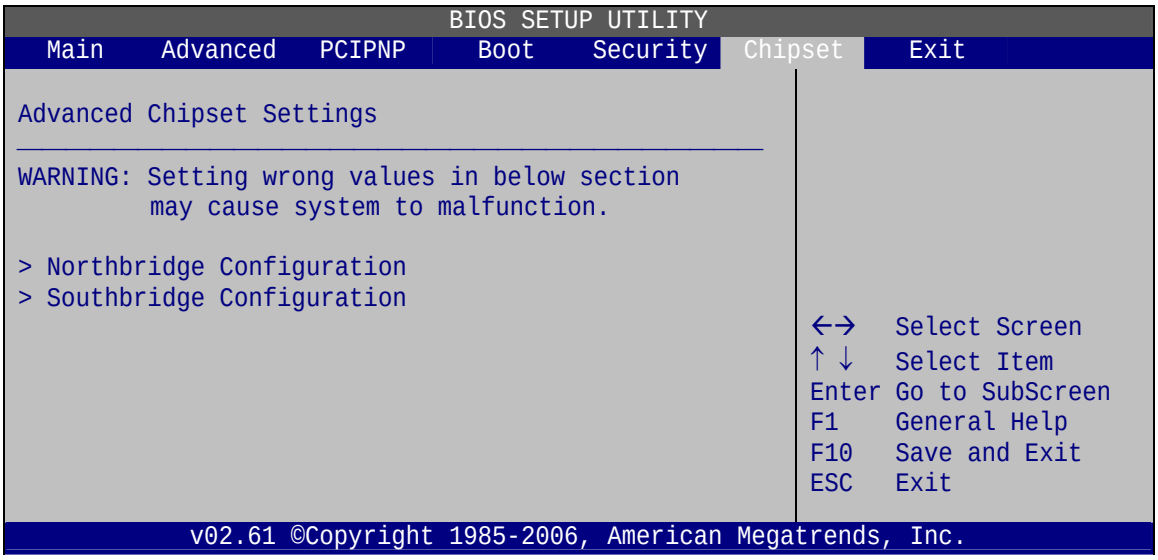
➔ **Disabled**	**DEFAULT**	Disables the boot sector virus protection
➔ **Enabled**		Enables the boot sector virus protection

5.7 Chipset

Use the **Chipset** menu (**BIOS Menu 18**) to access the Video configuration menu.

WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Advanced Chipset Settings
WARNING: Setting wrong values in below section
may cause system to malfunction.
> Northbridge Configuration
> Southbridge Configuration
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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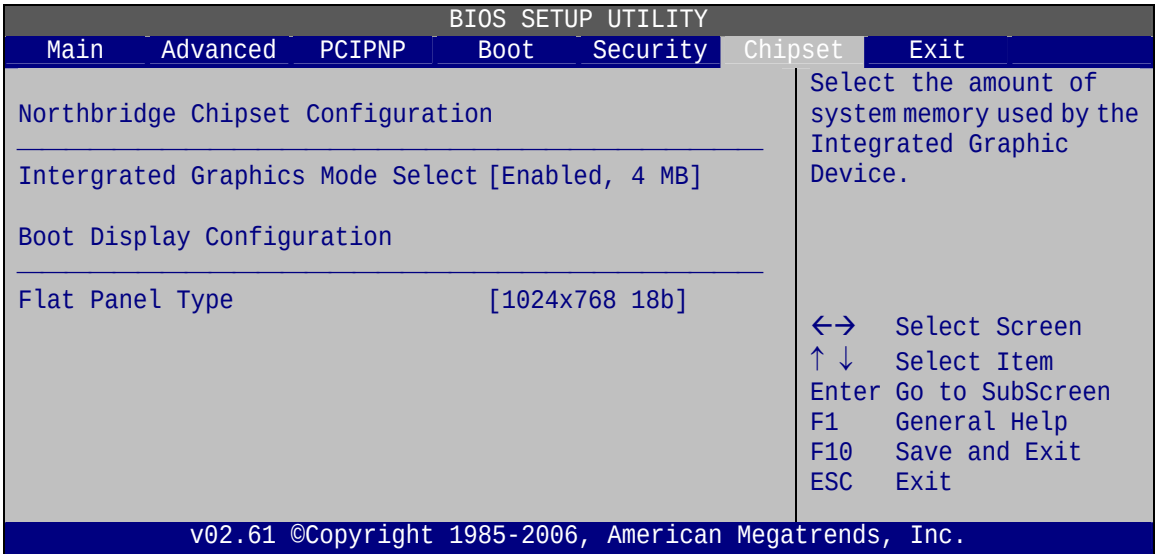
BIOS Menu 18: Chipset

5.7.1 Northbridge Chipset Configuration

Use the **Northbridge Chipset Configuration** menu (**BIOS Menu 19**) to set the configuration settings for the flat panel screen connected to the system.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Northbridge Chipset Configuration
Intergrated Graphics Mode Select [Enabled, 4 MB]
Boot Display Configuration
Flat Panel Type [1024x768 18b]
Select the amount of system memory used by the Integrated Graphic Device.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 19: Video Configuration

➔ **Integrated Graphics Mode Select [32 MB]**

Use the **Integrated Graphics Mode Select** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- Disabled
- Enabled, 1 MB
- Enabled, 4 MB **Default**
- Enabled, 8 MB

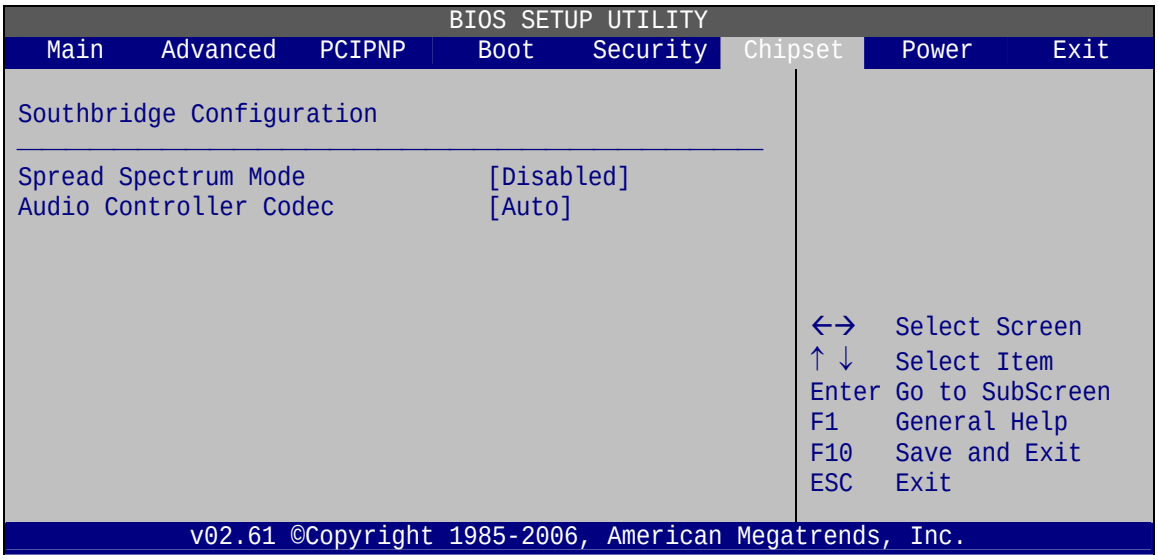
➔ **Flat Panel Type [1024 x 768 18b]**

Use the **Flat Panel Type** option to set the resolution of the flat panel screen connected to the system. The **Flat Panel Type** options are:

- 640 x 480 18b
- 800 x 480 18b
- 800 x 600 18b
- 1024 x 768 18b (Default)
- 1280 x 1024 36b
- 1400 x 1050 36b
- 1440 x 900 36b
- 1600 x 1200 36b

5.7.2 Southbridge Configuration

Use the **Southbridge Configuration** menu (**BIOS Menu 20**) to configure the audio controller and spread spectrum function of the Southbridge chipset.



BIOS Menu 20:Southbridge Chipset Configuration

➔ **Audio Controller Codec [Auto]**

Use the **Audio Controller Codec** option to enable or disable the audio controller codec.

➔ **Disabled**		The audio controller codec is disabled
➔ **Auto**	**DEFAULT**	The audio controller codec is automatically detected and enabled

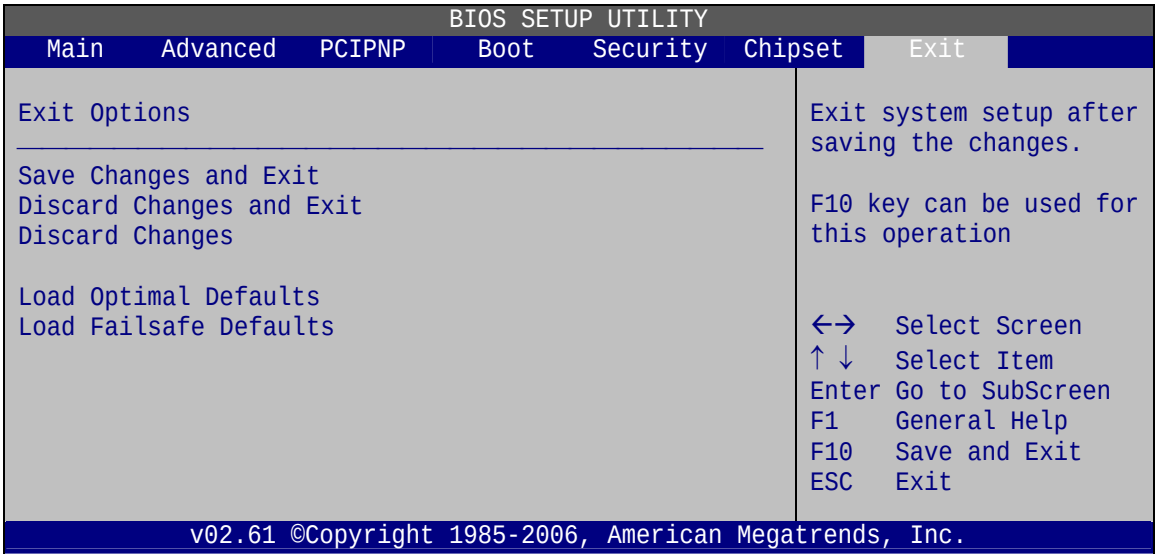
➔ **Spread Spectrum [Disabled]**

Use the **Spread Spectrum** option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

➔ **Disabled**	**DEFAULT**	EMI not reduced
➔ **Enabled**		EMI reduced

5.8 Exit

Use the **Exit** menu (**BIOS Menu 21**) to load default BIOS values, optimal failsafe values and to save configuration changes.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 21: Exit

➔ **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Appendix

A

BIOS Options

Below is a list of BIOS configuration options in the BIOS chapter.

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Load Failsafe Defaults 104

Appendix

B

Terminology

ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CompactFlash®	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Southbridge chipset.
GPIO	General purpose input

HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table C-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

EXAMPLE PROGRAM:

```
; INITIAL TIMER PERIOD COUNTER

;
W_LOOP:
;

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT     15H

;
; ADD THE APPLICATION PROGRAM HERE
;

        CMP     EXIT_AP, 1      ;is the application over?
        JNE     W_LOOP          ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT     15H

;
; EXIT ;
```

Appendix

D

Hazardous Materials Disclosure

D.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						